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**BASELINE HUMAN HEALTH RISK ASSESSMENT
FOR THE
GULFCO MARINE MAINTENANCE
SUPERFUND SITE
FREEPORT, TEXAS**

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TABLE OF CONTENTS

	<u>Page</u>
LIST OF TABLES	iii
LIST OF TABLES	iv
LIST OF FIGURES	iv
LIST OF PLATES	iv
LIST OF APPENDICES	v
1.0 INTRODUCTION	1
1.1 SITE LOCATION AND HISTORY	2
1.2 ENVIRONMENTAL SETTING	4
2.0 DATA EVALUATION AND IDENTIFICATION OF POTENTIAL CHEMICALS OF CONCERN	6
2.1 DATA EVALUATION	8
2.2 IDENTIFICATION OF POTENTIAL CHEMICALS OF CONCERN	10
2.2.1 Concentration-Toxicity Screen	11
2.2.2 Comparison to the Background Areas	12
3.0 EXPOSURE ASSESSMENT	14
3.1 POTENTIAL EXPOSURE PATHWAY EVALUATION	14
3.1.1 Land Use and Pathway Evaluation	15
3.1.2 Groundwater Use and Pathway Evaluation	15
3.1.3 Surface Water Use and Pathway Evaluation	16
3.1.4 Fish and Shellfish Resources and Pathway Evaluation	16
3.2 POTENTIALLY EXPOSED POPULATIONS	17
3.3 CONCEPTUAL SITE MODELS AND POTENTIALLY COMPLETE EXPOSURE PATHWAYS	18
3.4 QUANTIFICATION OF EXPOSURE	19
3.4.1 Estimating the Exposure Point Concentration	21
3.4.2 Quantifying Intake	22
3.4.3 Exposure Assumptions and Intake Calculations	24
3.4.4 Vapor Intrusion Pathway for Future On-Site Worker Scenarios	25
4.0 TOXICITY ASSESSMENT	27
4.1 EXPOSURE ROUTE-SPECIFIC TOXICITY CRITERIA	27
4.2 CARCINOGENIC EFFECTS	28
4.3 NONCARCINOGENIC EFFECTS	28
4.4 SOURCES OF TOXICITY CRITERIA	29
5.0 RISK CHARACTERIZATION	30
5.1 POTENTIAL CARCINOGENIC RISKS	30
5.2 POTENTIAL NONCARCINOGENIC HAZARD QUOTIENTS	31
5.3 CONTACT RECREATION SCENARIO	32
5.4 OFF-SITE RESIDENTIAL SCENARIO	32

5.5	FUTURE ON-SITE INDUSTRIAL WORKER VAPOR INTRUSION PATHWAY RISK ESTIMATES	32
6.0	UNCERTAINTY ASSESSMENT	34
6.1	DATA ANALYSIS UNCERTAINTIES.....	34
6.2	EXPOSURE ANALYSIS UNCERTAINTIES	35
6.3	TOXICITY ASSESSMENT UNCERTAINTIES	36
6.4	RISK CHARACTERIZATION UNCERTAINTIES	37
6.5	IMPACT OF UNCERTAINTIES	38
7.0	CONCLUSIONS	39
8.0	REFERENCES	40

LIST OF TABLES

<u>Table</u>	<u>Title</u>
1	Exposure Point Concentrations (mg/kg) – South Area Surface Soil
2	Exposure Point Concentrations (mg/kg) – South Area Soil
3	Exposure Point Concentrations (mg/L) – South Area Zone A Groundwater
4	Exposure Point Concentrations (mg/L) – Intracoastal Waterway Surface Water (Total)
5	Exposure Point Concentrations (mg/L) – Intracoastal Waterway Background Surface Water (Total)
6	Exposure Point Concentrations (mg/kg) – Intracoastal Waterway Sediment
7	Exposure Point Concentrations (mg/kg) – Intracoastal Waterway Background Sediment
8	Exposure Point Concentrations (mg/kg) – North Area Surface Soil
9	Exposure Point Concentrations (mg/kg) – North Area Soil
10	Exposure Point Concentrations (mg/L) – North Area Zone A Groundwater
11	Exposure Point Concentrations (mg/L) – Wetland Surface Water (Total)
12	Exposure Point Concentrations (mg/L) – Pond Surface Water (Total)
13	Exposure Point Concentrations (mg/kg) – Wetland Sediment
14	Exposure Point Concentrations (mg/kg) – Pond Sediment
15	Exposure Point Concentrations (mg/kg) – Background Soil
16	Background Comparisons
17	PCOCs Identified and Quantitatively Evaluated in the BHHRA
18	Exposure Scenarios by Media
19	Exposure Assumptions for the Industrial Worker Scenario
20	Exposure Assumptions for the Construction Worker Scenario
21	Exposure Assumptions for the Youth Trespasser Scenario
22	Exposure Assumptions for the Contact Recreation Scenario

LIST OF TABLES

<u>Table</u>	<u>Title</u>
23	Qualitative Current Off-Site Residential Receptor Evaluation – South Area Surface Soil
24	Qualitative Current Off-Site Residential Receptor Evaluation – South Area Soil
25	Johnson and Ettinger Vapor Intrusion Model Output for South Area Groundwater
26	Johnson and Ettinger Vapor Intrusion Model Output for North Area Groundwater
27	Summary of Hazard Indices and Cancer Risk Estimates for Soil Exposure

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>
1	Site Location Map
2	Wetland Map
3	Soil and Intracoastal Waterway Sediment and Surface Water Background Sample Locations
4	Human Health Conceptual Site Model South Area
5	Human Health Conceptual Site Model North Area

LIST OF PLATES

<u>Plate</u>	<u>Title</u>
1	Investigation Sample Locations

LIST OF APPENDICES

<u>Appendix</u>	<u>Title</u>
A	Pro UCL Output
B	Background Comparisons
C	Intake Calculations
D	Risk Calculations
E	Restrictive Covenants

1.0 INTRODUCTION

The United States Environmental Protection Agency (EPA) named the former site of Gulfco Marine Maintenance, Inc. (the Site) in Freeport, Brazoria County, Texas to the National Priorities List (NPL) in May 2003. The EPA issued a modified Unilateral Administrative Order (UAO), effective July 29, 2005, which was subsequently amended effective January 31, 2008. The UAO required the Respondents to conduct a Remedial Investigation and Feasibility Study (RI/FS) for the Site. The Statement of Work (SOW) for the RI/FS at the Site, provided as an Attachment to the UAO from the EPA, requires the performance of a Baseline Human Health Risk Assessment (BHHRA) to “evaluate and assess the risk to human health posed by the contaminants present at the Site.” As specified in Paragraph 37a of the SOW, BHHRA activities include the submittal of Draft and Final Potential Chemicals of Concern (PCOC) Memoranda and Draft and Final Exposure Assessment (EA) Memoranda, ending with a Draft and Final BHHRA. In order to expedite completion of the RI/FS through submittal of a single BHHRA deliverable, the interim BHHRA deliverables (i.e., the PCOC and EA Memoranda) have been incorporated in this BHHRA.

Pursuant to Paragraphs 17 through 28 of the SOW, an RI/FS Work Plan and a Sampling and Analysis Plan were prepared for the Site. These documents were approved with modifications by EPA on May 4, 2006 and were finalized on May 16, 2006. This BHHRA has been prepared in accordance with Section 5.7.1 of the approved RI/FS Work Plan (the Work Plan) (PBW, 2006a). The BHHRA was prepared by Pastor, Behling & Wheeler, LLC (PBW), on behalf of LDL Coastal Limited LP (LDL), Chromalloy American Corporation (Chromalloy), and The Dow Chemical Company (Dow), collectively, the Gulfco Restoration Group (GRG).

A BHHRA is the systematic, scientific characterization of potential adverse effects resulting from exposures to hazardous agents or situations (NRC, 1983). The results of the BHHRA are used to support risk management decisions and determine if remediation or further action is warranted at a site.

The RI/FS is the methodology that the Superfund program has established for characterizing the nature and extent of risks posed by uncontrolled hazardous wastes sites and for developing and evaluating remedial options. The risk assessment methodology is based on approaches described by the United States Environmental Protection Agency (EPA) in *Risk Assessment Guidance for Superfund (RAGS), Volume 1, Human Health Evaluation Manual, Part A* (EPA, 1989) and various supplemental and

associated guidance (e.g., EPA, 1986; 1991a and b; 1992a and b; 1997a; 1999; 2001; 2002a, and b; 2004a and b; 2007; and 2008). The BHHRA generally consists of the following components:

- Review of analytical data and identification of potential chemicals of concern (PCOCs);
- Exposure assessment, including identification of potentially exposed populations, exposure pathways, and chemical intakes;
- Human health toxicity assessment;
- Risk characterization; and
- Uncertainty analysis.

The Nature and Extent Data Report (NEDR) (PBW, 2009) describes the history and background of the Site, and the environmental investigations conducted during the various phases of the RI. It also includes all of the analytical data generated during the RI and a discussion of the environmental conditions at the Site.

Section 2.0 of the BHHRA describes the process for evaluating the data and selecting PCOCs. Section 3.0 provides the exposure assessment. The toxicity assessment is contained in Section 4.0. Risks are characterized in Section 5.0. Section 6.0 describes uncertainties associated with the risk assessment process. Section 7.0 presents the conclusions of the risk assessment. Appendix A provides statistical calculations for the analytical data, by media; Appendix B provides the statistical comparisons between Site data and background data; Appendix C provides the intake calculations for the receptors evaluated herein; Appendix D provides the risk calculations; and Appendix E provides a copy of the restrictive covenants for the Site.

1.1 SITE LOCATION AND HISTORY

The Site is located northeast of Freeport, Texas in Brazoria County at 906 Marlin Avenue (also referred to as County Road 756). The Site consists of approximately 40 acres within the 100-year coastal floodplain along the north bank of the Intracoastal Waterway between Oyster Creek to the east and the Old Brazos

River Channel to the west. Figure 1 provides a map of the Site vicinity; Plate 1 provides a detailed Site map and shows site features and sampling locations.

During the 1960s, the Site was used for occasional welding but there were no on-site structures (Losack, 2005). According to the Hazard Ranking Score Documentation (TNRCC, 2002), from 1971 through 1999, at least three different owners used the Site as a barge cleaning facility. Beginning in approximately 1971, barges were brought to the facility and cleaned of waste oils, caustics and organic chemicals, with these products stored in on-site tanks and later sold (TNRCC, 2002). Sandblasting and other barge repair/refurbishing activities also occurred on the Site. At times during the operation, wash waters were stored either on a floating barge, in on-site storage tanks, and/or in surface impoundments on Lot 56 of the Site. The surface impoundments were closed under the Texas Water Commission's (TCEQ predecessor agency) direction in 1982 (Carden, 1982).

Marlin Avenue divides the Site into two areas. For the purposes of this report, it is assumed that Marlin Avenue runs due west to east. The property to the north of Marlin Avenue (the North Area) consists of undeveloped land and the closed impoundments, while the property south of Marlin Avenue (the South Area) was developed for industrial uses with multiple structures, a dry dock, sand blasting areas, an aboveground storage tank (AST) tank farm that is situated on a concrete pad with a berm, and two barge slips connected to the Intracoastal Waterway.

The South Area is zoned as "W-3, Waterfront Heavy" by the City of Freeport. This designation provides for commercial and industrial land use, primarily port, harbor, or marine-related activities. The North Area is zoned as "M-2, Heavy Manufacturing." Restrictive covenants prohibiting any land use other than commercial/industrial and prohibiting groundwater use have been filed for all parcels within both the North and South Areas. Additional restrictions requiring any building design to preclude vapor intrusion have been filed for Lots 55, 56, and 57. A further restriction requiring EPA and TCEQ notification prior to any building construction has also been filed for Lot 55, 56, and 57. Copies of these covenants, including parcel maps with the specific Lot identified, are provided in Appendix E.

Adjacent property to the north, west and east of North Area is unused and undeveloped, and/or is designated as wetlands as shown in Figure 2. Adjacent property to the east of the South Area is currently used for industrial purposes while the property directly to the west of the Site is currently vacant and previously served as a commercial marina. The Intracoastal Waterway bounds the Site to the south. Residential areas are located south of Marlin Avenue, approximately 300 feet west of the Site, and 1,000 feet east of the Site.

1.2 ENVIRONMENTAL SETTING

The Site is located between Galveston and Matagorda Bays and is situated along approximately 1200 feet (ft.) of shoreline on the Intracoastal Waterway. The Intracoastal Waterway is a coastal shipping canal that extends from Port Isabel to West Orange on the Texas Gulf Coast and is a vital corridor for the shipment of bulk materials and chemicals. It is the third busiest shipping canal in the United States, and along the Texas coast carries an average of 60 to 90 million tons of cargo each year (TxDOT, 2001). Of the cargo carried between Galveston and Corpus Christi, TX, 49 percent is comprised of petroleum and petroleum products and 38 percent is comprised of chemicals and related products. Approximately 50,000 trips were made by vessels making the passage through the Intracoastal Waterway between Galveston and Corpus Christi, TX in 2006 (USACE, 2006).

The South Area includes approximately 20 acres of upland that were created from dredged material from the Intracoastal Waterway. Prior to construction of the Intracoastal Waterway, this area was most likely coastal wetlands. The North Area, excluding the capped impoundments, the uplands area, and access roads, is considered estuarine wetland (USFWS, 2008), as shown in Figure 2. The North Area consists of approximately five acres of upland, which supports a variety of herbaceous vegetation that is tolerant of drier soil conditions, while the North Area wetlands are approximately 15 acres in size. The wetlands at the Site are typical of irregularly flooded tidal marshes of the Texas Gulf Coast and supports wildlife that would be common in the Texas coastal marsh.

There are two ponds on the North Area, located east of the former surface impoundments (Plate 1). The larger of the two ponds is called the Fresh Water Pond while the other pond is referred to as the Small Pond. It should be noted, however, that based on field measurements of salinity, the water in the Fresh Water Pond is brackish while water in the Small Pond is less brackish (but is not fresh water). The Fresh Water Pond water depth is generally 4 to 4.5 feet. The Small Pond is a shallow depression that tends to dry out during summer months and periods of drought. The water depth in the Small Pond was approximately 0.2 feet when sampled in July 2006 and nearly dry when sampled in June 2008.

The Intracoastal Waterway supports barge traffic and other boating activities. Fishing has been known to occur on and near the Site. Red drum (*Sciaenops ocellatus*), black drum (*Pogonias cromis*), spotted seatrout (*Cynoscion nebulosus*), southern flounder (*Paralichthys lethostigma*) and other species are reportedly caught in the Freeport Area (TPWD, 2009). It should be noted that, during the fish sampling conducted for the human health fish ingestion pathway risk assessment, red drum were not caught (using nets) as frequently as other species (see discussion in NEDR (PBW, 2009)), presumably because of a lack

of habitat and prey items near the Site. Recreational and commercial fishermen reportedly collect blue crabs (*Callinectes sapidus*) from waterways in the region. The Texas Department of State Health Services (TDSHS) has banned the collection of oysters from this area due to biological hazards and has issued a consumption advisory for king mackerel for the entire Gulf Coast due to mercury levels in the fish (TDSHS, 2005).

2.0 DATA EVALUATION AND IDENTIFICATION OF POTENTIAL CHEMICALS OF CONCERN

This section describes the general data evaluation procedures that were used to ensure that data included in the risk assessment are of sufficient quality for quantitative risk assessment, as per EPA (1992a) guidance. This section also presents the methods that were followed to identify PCOCs for applicable exposure media in the BHHRA. Data collected as part of the RI were collected to support three objectives: nature and extent evaluation, risk assessment, and evaluation of potential remedial alternatives. The NEDR (PBW, 2009) discusses data collected to define the nature and extent of contamination at the Site and may contain data that are not of concern from a human health exposure perspective (e.g., Zone B and Zone C groundwater due to high total dissolved solids concentration and restrictive covenants precluding Site groundwater use (Appendix E)).

For the purposes of this risk assessment, a chemical of interest (COI) is defined as any compound detected in at least one environmental sample. A PCOC is any compound that does not get eliminated from further consideration based on frequency of detection, evaluation with blank contamination or background concentrations, and a concentration-toxicity screen, described in this section. PCOCs are quantitatively evaluated in the risk assessment. A chemical of concern (COC) is a compound that is determined as part of the risk assessment to present a potential adverse human health risk and will be evaluated further in the Feasibility Study, if necessary.

Data related to the nature and extent of potential contamination at the Site were obtained as part of the RI and, as noted previously, are discussed in the NEDR (PBW, 2009). Unless otherwise noted, the samples were analyzed for the full suite of analytes as specified in the approved Work Plan (PBW, 2006a). Plate 1 provides sample locations for site-related samples, and Figure 3 provides sample locations for the background soil, surface water, and sediment samples. Tables 1 through 15 summarize the key parameters for the COIs measured in these samples and provide maximum and minimum measured concentrations, as well as summary statistics for each COI for each media. Average and 95% upper confidence limits (95% UCLs) on the mean were estimated using EPA guidance (EPA, 2002b) and are presented in the tables as well. The method for estimating the average and 95% UCLs is described in greater detail in the Section 3.4.

Eighty-three surface soil samples (0 to 0.5 ft below ground surface (bgs)) and 83 subsurface soil samples (0.5 ft to 4 ft bgs) were collected in the South Area (summarized in Tables 1 and 2). Eighteen surface soil samples and 18 subsurface soil samples were collected in the North Area (summarized in Tables 8 and 9).

Two additional surface soil samples were collected near the former transformer shed at the South Area for polychlorinated biphenyls (PCBs) analyses only. Ten background soil samples were collected within the approved background area approximately 2,000 feet east of the Site near the east end of Marlin Avenue (summarized in Table 15; sample locations shown on Figure 3).

Thirteen groundwater samples were collected from Zone A in the South Area (summarized in Table 3) and sixteen groundwater samples were collected from Zone A in the North Area (summarized in Table 10). The groundwater investigation evaluated contamination in deeper zones, Zones B and C. This information is discussed in the NEDR (PBW, 2009) but was not included in the BHHRA since it is unlikely that contaminants in deeper groundwater affect the media evaluated in the risk assessment based on high TDS and the restrictive covenants on the property (Appendix E).

Sixteen sediment samples were collected from the Intracoastal Waterway in front of the Site (summarized in Table 6). One additional sediment sample was collected from the Intracoastal Waterway near the Site and analyzed for DDT to further characterize the extent of contamination as described in the NEDR (PBW, 2009). Nine background sediment samples were collected from the Intracoastal Waterway east of the Site and across the canal (summarized in Table 7). Forty-eight sediment samples were collected in the North Area wetlands (summarized in Table 13). Seven additional sediment samples were collected from the North Area wetlands and analyzed for DDT; five of these samples were also analyzed for zinc. A total of eight sediment samples were collected from the two ponds located in the North Area (summarized in Table 14).

Four surface water samples were collected in the Intracoastal Waterway adjacent to the Site (summarized in Table 4). Four surface water samples were collected from the background surface water area, located in the Intracoastal Waterway east of the Site, and across the canal (summarized in Table 5; sampling locations shown on Figure 3). Four surface water samples were collected in the wetlands drainage areas north of Marlin Avenue (summarized in Table 11) and a total of six surface water samples were collected from the two ponds located in the North Area (summarized in Table 12). Chemical analyses of these surface water samples included both total and dissolved concentrations of metals. For the purposes of the BHHRA, total concentrations were used since it is unlikely that samples would be filtered prior to incidental exposure as defined by the scenarios evaluated in this risk assessment.

2.1 DATA EVALUATION

The Quality Assurance Project Plan (QAPP) (PBW, 2006c) and Field Sampling Plan (FSP) (PBW, 2006b), which were developed concurrently with the RI/FS Work Plan (PBW, 2006a), were designed to ensure that the data collected during the RI are appropriate for quantitative risk assessment. After RI data collection, the existing data and RI data were subject to a data evaluation following procedures recommended by EPA (1992a) to ensure that these data are of adequate quality for quantitative risk assessment and to support risk management decisions. These include consideration of the following factors: data sources, completeness of documentation, adequacy of detection limits, and “data quality indicators” as defined by the EPA (1992a) guidance. The data quality indicators include: 1) sampling completeness; 2) representativeness of sampling locations for relevant exposure areas; 3) usability indicated by data validation results (including considerations of laboratory precision and accuracy); and 4) comparability of data analyzed by different methods. Data representativeness is one of the most important criteria when selecting data for use in the quantitative risk assessment. Representativeness is the extent to which data characterize potential exposure and hence risks to human health and the environment. Data selected for use in the quantitative risk assessment should be of overall high quality, and data validation should confirm that the data collected during the RI are of adequate quality for risk assessment.

Data validation was performed following the procedures set forth in the RI/FS Work Plan (PBW, 2006a) and the QAPP (PBW, 2006c). Results of the data evaluation and validation for the BHHRA data set are summarized as follows:

- Data Sources – All BHHRA data were generated using rigorous analytical methods (i.e., EPA-approved methods) by a single analytical laboratory with a documented quality system (i.e., accredited under the National Environmental Laboratory Accreditation Program). Historical data was not used for the BHHRA.
- Completeness of Documentation – Field sampling activities were documented on field data sheets. Sample custody was documented to maintain security and show control during transfer of samples. Analytical results were reported in laboratory data packages containing all information necessary for the data validation.
- Adequacy of Detection Limits – The QAPP specifies target Method Detection Limits (MDL), which were established based on the laboratory’s capabilities and are less than the human health

Preliminary Screening Value (PSV), where possible, based on the standard available method with the lowest possible MDL. The MDL, as reported by the laboratory, for all constituents is at or below the target MDL or the human health PSV for the BHHRA data set except for 3,3'-dichlorobenzidine in the four Phase 2 surface water samples and benzidine in the seventeen Phase 2 sediment samples, one Phase 3 sediment sample, and four Phase 4 sediment samples. (For Phase 1, the sample detection limits, or SDLs, are below the target MDLs for both of these constituents. Benzidine was not detected in any sample from the Site and 3,3'-dichlorobenzidine was only detected in a one sediment sample from the Site.)

- Data Quality Indicators

- Sampling Completeness – The percentage of environmental samples collected versus that planned is 100% for samples critical to the BHHRA and is greater than the QAPP goal of 90% for every media and test except chromium VI. Chromium VI analyses were not performed for most of the Phase 1 sediments and all of the Phase 1 soils. However, there is no effect on usability for the BHHRA data set since total chromium, which includes any chromium VI, is reported for all samples.
- Representativeness of Sampling Locations – Phase 1 samples were collected in accordance with the sampling plan presented in the FSP (PBW, 2006b), which was designed to meet the Data Quality Objectives (DQOs) detailed in the QAPP (PBW, 2006c), and additional samples were collected as needed based on the results of the initial sampling event. All samples were properly located and collected using approved standard operating procedures. As described in the RI/FS Work Plan (PBW, 2006a), it was decided that the majority of the soil and sediment sampling would be conducted on a random grid basis with some focused sampling in areas of known historical use. This type of sampling program is appropriate for estimating risks since human health exposure generally occurs randomly over a site, or a portion of a site. Plate 1 shows locations of soil, surface water, sediment and groundwater samples.
- Data Validation Results – All data were validated using an approved standard operating procedure (Appendix F in the QAPP) based on the EPA *National Functional Guidelines* for organics and inorganics, respectively (EPA, 1999 and 2002c). A Level III validation including all quality control (QC) checks such as spike recovery, duplicate precision, blanks, holding time, calibration, surrogates, and internal standards was completed for 100% of the samples. Additionally, a Level IV validation that included examination of the raw data was completed for 10% of the soil, sediment, and surface water samples as stipulated in the QAPP. If a QC deficiency was found, sample results were flagged as

estimated (with expected direction of bias, where possible), blank-affected (due to contamination in an associated field or laboratory blank), or rejected (due to a major QC deficiency).

- Comparability of Data – Data were generated using the same analytical method for each constituent except naphthalene. Naphthalene was analyzed using SW-846 Method 8260B for all samples but four groundwater samples, which were analyzed using SW-846 Method 8270C. Both methods are rigorous analytical methods performed by a fixed analytical laboratory with a documented quality system meeting stringent QC requirements (unless qualified as rejected) and thus are comparable. All sample results are in standardized units of measure with dry-weight correction for soils and sediments.

As per EPA (1989 and 1992a), validated data qualified as J (estimated) and U (blank-affected) are included in the risk assessment. For quantitative purposes, when a compound was not detected or was blank-affected, one-half of the sample quantitation limit (as defined by the U.S. EPA (1992a)) was used as a proxy to provide a measurement for analysis. Only those data that were rejected (i.e., qualified as “R”) were not included in the quantitative risk assessment. As indicated in the RI/FS Work Plan (PBW, 2006a), once the data collection, chemical analysis, and data evaluation/validation were complete, the data were analyzed to identify COIs for the human health risk assessment. The following section describes the process for determining whether a COI became a PCOC and was evaluated further in the BHHRA.

2.2 IDENTIFICATION OF POTENTIAL CHEMICALS OF CONCERN

EPA guidance (EPA, 1989) recommends considering several steps to eliminate compounds from further evaluation and, as such, this section describes the process used to reduce the list of chemicals evaluated in the BHHRA. Compounds were eliminated from further consideration if: 1) they were detected infrequently in a given media (i.e., in less than five percent of the samples); 2) they were measured at similar concentrations in blank samples; 3) they were measured at similar concentrations in background samples; or 4) they were detected at a high concentration (above one tenth of the screening value discussed below).

All analytes detected in at least one sample above the detection limit (including “J-flagged” data) were initially reviewed. If a compound was detected in less than five percent of the samples, the compound was eliminated from further evaluation for that media. This step was only considered in media where

twenty or more samples were collected and if that compound was not present in another media. The lab did not report any blank contamination issues with the data so no compounds were eliminated based on this criterion.

The data for soil, groundwater, surface water, and sediment are summarized in Tables 1 through 15. These tables show the frequency of detection, minimum, maximum, and average concentration for each COI. The 95% upper confidence limit (95% UCL) on the mean concentration was calculated as described in Section 3. Appendix A provides the statistical calculations for these data.

2.2.1 Concentration-Toxicity Screen

A “concentration-toxicity screen” step, as recommended by EPA (EPA, 1989), was conducted to limit the number of chemicals that were included in a quantitative risk assessment while also ensuring that all chemicals that might contribute significantly to the overall risk were addressed. The screening values used were $1/10^{\text{th}}$ of the human health criteria, which were the lower of the EPA or TCEQ values as presented in the NEDR (PBW, 2009) for soil, surface water, and sediment. These screening criteria were compared to the maximum measured concentration and those compounds measured in excess of the screening criteria have been denoted in bold on Tables 1, 2, 4, 6, 8, 9, 11, 12, 13, and 14. Because there are no readily available screening levels appropriate for the complete groundwater pathway at the Site, all chemicals of interest for groundwater media (Tables 3 and 10) were quantitatively evaluated in the risk assessment. A similar screen was conducted for media collected at the background areas (Tables 5, 7, and 15), but this was done merely for comparative purposes. Risks associated with background concentrations were not calculated in the BHHRA.

Exposure and risk calculations were not estimated for the surface water pathway in the Intracoastal Waterway and Wetlands Area because none of the measured maximum COI concentrations exceeded $1/10^{\text{th}}$ of their respective TCEQ’s contact recreation Protection Concentration Level (PCL). These PCLs were developed for a child exposure scenario for noncarcinogenic compounds, and an age-adjusted scenario for carcinogenic compounds. The PCL is based on incidental ingestion and dermal contact of surface water while swimming for three hours, 39 times per year. It is believed that this is a bounding estimate for the Intracoastal Waterway, surface water north of Marlin Ave., and the ponds north of Marlin Ave. since none of these surface water bodies are very favorable for swimming and true exposure is likely to be much less than the scenario described by TRRP’s contact recreation PCL. All surface water concentrations were well below $1/10^{\text{th}}$ of the PCL for the Intracoastal Waterway and wetlands area

surface water. Maximum measured concentrations of arsenic and thallium in the pond samples exceeded $1/10^{\text{th}}$ of their respective PCL but did not exceed the PCL and, therefore, neither were retained for further evaluation. Although TCEQ does not provide a PCL for iron, one was calculated using the contact recreation assumptions (TCEQ, 2006). Measured concentrations of iron in surface water were well below the calculated contact recreation PCL of 2,800 mg/L. Therefore, it was concluded that chemical concentrations of PCOCs in surface water samples from the Intracoastal Waterway near the Site, surface water in the North Area wetlands, and surface water in the North Area ponds do not pose an unacceptable health risk and chemical concentrations in these media were not evaluated further in the BHHRA.

2.2.2 Comparison to the Background Areas

To help provide an understanding of what COIs and concentrations are considered to be Site-related, a background evaluation was conducted (as described in the Work Plan (PBW, 2006a)) that included: 1) soil samples from ten off-site locations; 2) sediment samples from nine off-site locations in the Intracoastal Waterway; and 3) surface water samples within four off-site “zones” in the Intracoastal Waterway. This information was used to characterize Site conditions in the NEDR (PBW, 2009).

The soil background data were compared to soil from the South Area and North Areas of the Site, as well as sediments from the North wetland and the North Area ponds. As described in the NEDR (PBW, 2009), based on similarities in composition and condition between background soil and sediments of the North wetlands area, this comparison was appropriate. Sediment and surface water data for the Intracoastal Waterway samples were compared to sediment and surface water data collected in the Intracoastal Waterway background location.

Comparisons between Site sampling data and Site-specific background data were conducted for all inorganic compounds measured regardless if they exceeded the concentration-toxicity screen. The background comparisons were performed in accordance with EPA’s *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (EPA, 2002d). Distribution testing was conducted to estimate 95% UCLs and the summary statistics were used to perform comparison of the means analyses. The output of these background statistical comparison tests is provided in Appendix B. Table 16 summarizes the results of the testing and indicates whether the Site data were found to be statistically different than the background data.

In several instances (e.g., lithium in South Area soil; barium in North Area wetlands sediment), statistical differences between the two data sets were due to higher concentrations in the background population, as

noted in Table 16. If there was not Site-specific background data for a COI (as noted in Table 16 with an “NA”) and it was measured in excess of $1/10^{\text{th}}$ of the screening level, the COI was retained for further evaluation in the BHHRA (e.g., iron). COIs shown to be statistically different (and higher) when compared to background data were also retained for quantitative evaluation in the BHHRA. The PCOCs carried through the BHHRA for soil, surface water, and sediment are listed in Table 17.

A statistical comparison between Site surface water and background surface water could not be conducted given the small size of both data sets. Visual inspection of the data indicates that there is no consistent observable difference between the data sets for the COIs. It should be noted, however, that all COIs in surface water were screened out during the toxicity-concentration step and are not evaluated further in the BHHRA.

Background groundwater data were not collected as part of the RI. Therefore, all COIs detected in Zone A groundwater, as shown in Tables 3 and 10 for the South Area and North Area, respectively, were evaluated quantitatively in the BHHRA and are discussed in greater detail in the following sections.

3.0 EXPOSURE ASSESSMENT

The exposure assessment estimates the extent of human contact with PCOCs by characterizing potentially exposed populations (i.e., receptors), identifying actual or potential routes of exposure, and quantifying the intake (or dose) of human exposure. The exposure assessment also identifies possible exposure pathways that are appropriate for each potential receptor and exposure scenario and considers the source of contamination and fate and transport properties of the compound and surrounding environment. An exposure pathway typically includes the following elements:

- A source of contaminant and mechanism of contaminant release;
- An environmental retention or transport medium (e.g., air, groundwater, etc.);
- A point of contact with the medium (i.e., receptor or potentially exposed population); and
- A route of human intake (e.g., inhalation, ingestion, etc.).

Each of these elements must generally be present for an exposure pathway to be complete, although it is not necessary that environmental transport occurs when assessing exposure from direct contact. Exposure was evaluated for both current and potential future receptors to allow for evaluation of long-term risk management options.

3.1 POTENTIAL EXPOSURE PATHWAY EVALUATION

The identification of potentially exposed populations (also called receptors) possibly at risk from exposure to PCOCs at the Site is dependent on current and future land uses. The Site is located at 906 Marlin Avenue in Freeport, TX, as shown on Figure 1.

The Site consists of approximately 40 acres within the 100-year coastal floodplain along the north bank of the Intracoastal Waterway between Oyster Creek to the east and the Old Brazos River Channel to the west (Figure 1). Approximately 78 people live within the one square mile area surrounding the Site (EPA, 2005a). Approximately 3,392 people live within 50 square miles of the Site (EPA, 2005a). There are no schools, nursing homes, or other sensitive subpopulations within a mile of the Site. Residential areas are located south of Marlin Avenue, approximately 300 feet west of the Site, and 1,000 feet east of the Site.

3.1.1 Land Use and Pathway Evaluation

Historically, the South Area of the Site was used as a barge cleaning and maintenance facility. The Site currently is unused but it is anticipated that the South Area will be used for commercial/industrial purposes in the future. The South Area includes approximately 20 acres of upland that was created from dredged material from the Intracoastal Waterway. To the west of and directly adjacent to the Site is an unused lot that was formerly a commercial marina. West of that lot, beyond a second vacant lot, is a residential development with access to the Intracoastal Waterway. An active commercial operation is located east of the South Area.

The North Area of the Site contains closed surface impoundments (closed in 1982) and is, for the most part, unused. Some of the North Area is upland created from dredge spoil, but most of this area is considered wetlands (Figure 2) and the wetlands area has never consistently been used. According to the National Wetlands Inventory map for the Freeport Quadrangle, the wetlands on the north of the Site are estuarine, intertidal, emergent, persistent, and irregularly flooded. The upland area of the North Area has been used as a parking lot. Future land use at the North Area is limited given that much of it is considered wetlands and most of the upland part of the North Area consists of the closed former surface impoundments.

3.1.2 Groundwater Use and Pathway Evaluation

Because of high total dissolved solids in Zone A, B, and C groundwater at the Site, the groundwater ingestion and use pathway is incomplete for these three units. Also, as noted previously, restrictive covenants prohibiting groundwater use have been filed for the Site. Based on Site potentiometric and analytical data presented in the NEDR (PBW, 2009), impacted groundwater does not affect surface water at the Site. Thus, the only complete exposure pathway is the volatilization to indoor and outdoor air pathway in areas above impacted groundwater. A restrictive covenant requiring any building design to preclude vapor intrusion has been filed for Lots 55, 56, and 57 where VOC concentrations were measured in relatively high concentrations in Zone A groundwater. Nevertheless, this pathway was conservatively evaluated in the BHHRA.

3.1.3 Surface Water Use and Pathway Evaluation

The Intracoastal Waterway supports barge traffic and other activities. It is one of the main arteries for shipping goods from Freeport's deep-water port to destinations along the Texas Coast and beyond. Fishing boats also use the Intracoastal Waterway to gain access to the fishing grounds in the Gulf of Mexico and the shorelines, tributaries, and marshes of the many Texas Bays. The area near the Site is regularly dredged. The nearby residential areas have canal access to the Intracoastal Waterway.

As noted previously, impacted groundwater does not discharge to surface water at the Site. However, surface water data were collected for the Intracoastal Waterway, as well as surface waters contained in the wetlands and ponds on the North Area to evaluate the potential for contaminants in surface soils to be released to surface water via overland surface runoff. A contact recreation scenario was included in the risk assessment to evaluate risks associated with occasional swimming and wading in surface water of the Intracoastal Waterway, and surface waters on the North Area. Based on the screening evaluation presented in Section 2.2.1, the surface water pathway was eliminated from further consideration since it does not pose an adverse human health risk.

3.1.4 Fish and Shellfish Resources and Pathway Evaluation

As mentioned previously, fishing and crabbing are reported to occur in waters of the Intracoastal Waterway in the general vicinity of the Site. Based on the analytical results for the Intracoastal Waterway sediment samples and in accordance with Section 5.6.8 of the Work Plan, fish tissue samples were collected from four Site zones and one background area within the Intracoastal Waterway. Red drum (*Sciaenops ocellatus*) (6 samples), spotted seatrout (*Cynoscion nebulosus*) (9 samples), southern flounder (*Paralichthys lethostigma*) (9 samples), and blue crab (*Callinectes sapidus*) (9 samples) samples were collected from the Site for laboratory analysis. Samples of these species were also collected from the background area and were archived.

The Site fish tissue samples (fillet samples for finfish, edible tissue for crabs) were analyzed for 12 COIs, based on Intracoastal Waterway sediment data, in accordance with EPA's November 14, 2006 letter. The only COIs with concentrations measured above sample detection limits in any of the 33 samples were silver (detected in four samples), benzo(b)fluoranthene (detected in two samples), and 4,4'-DDE (detected in two samples). The fish tissue data were used to calculate potential risks associated with exposure to Site COIs via the fish ingestion pathway to recreational anglers fishing at the Site, or their

families. This risk assessment (presented in a March 20, 2007 letter to EPA) concluded that the fish ingestion pathway does not pose a human health threat (PBW, 2007). That conclusion was subsequently approved in a June 29, 2007 letter from EPA.

In addition, shellfish harvesting is banned by the Texas Department of Health Services, Seafood Safety Division in all waterbodies from an area about two miles east of the Site, to well beyond the Brazos River inlet, about 7 miles west of the Site. The ban has been enacted because of poor conditions and water quality. It should be noted, however, that risk from shellfish consumption harvested from the area if allowed would most likely not pose a human health risk, since exposure would be similar if not the same as for the fish and crab ingestion pathway.

For the reasons described above, the fish/shellfish pathways were not evaluated further in this risk assessment. The pathway was included in the Conceptual Site Model as discussed in Section 3.3 below.

3.2 POTENTIALLY EXPOSED POPULATIONS

Based on current and reasonable future land use, potentially exposed populations for the South Area include: 1) future commercial/industrial workers and 2) future construction workers at the Site. A youth trespasser was also evaluated since, although the South Area perimeter is fenced, this area could still be accessed by a trespasser via the Intracoastal Waterway. Soil is the primary media of concern for these receptors. A future indoor air exposure pathway was evaluated for the commercial/industrial worker since volatile organic compounds (VOCs) were detected in Zone A groundwater. Additionally, a contact recreation scenario was assessed for surface water and sediment in the Intracoastal Waterway to represent a hypothetical person who occasionally contacts these media while swimming, wading, or participating in other recreational activities. Potential impacts from fugitive dust generation and VOC emissions, and subsequent exposure to nearby residents were also considered in the BHHRA.

Based on current and reasonable future land use, potentially exposed populations include future commercial/industrial workers and future construction workers at the Site. A youth trespasser was also evaluated since this area is not fenced. Soil is the primary media of concern for these receptors. A future indoor air exposure pathway was evaluated for the commercial/industrial worker since VOCs were detected in Zone A groundwater. Additionally, a contact recreation scenario was assessed for surface water and sediment in the wetlands and ponds of the North Area to represent a hypothetical receptor who occasionally contacts these media while wading, birding, or participating in other recreational activities.

Given the frequently saturated nature of the wetlands sediment and the abundant vegetation on the uplands portion of the North Area, fugitive dust generation and VOC emissions, and off-site impacts were not considered.

Table 18 summarizes the various exposure scenarios evaluated in the BHHRA by media. While exposure might occur at the background locations, exposure and potential risks for background areas were not evaluated in the BHHRA.

3.3 CONCEPTUAL SITE MODELS AND POTENTIALLY COMPLETE EXPOSURE PATHWAYS

A conceptual site model (CSM) identifies exposure pathways for potentially complete pathways at the Site and describes the process or mechanism by which human receptors may reasonably come into contact with Site-related constituents. A CSM was developed as part of the Work Plan (PBW, 2006a) to focus the data collection activities of the RI so that analytical data could support a risk-based analysis. These preliminary CSMs were included as Figures 7 and 8 in the Work Plan (PBW, 2006a) and summarized exposure to the North Area and South Area, respectively.

Figures 4 and 5 of the BHHRA provide revised CSMs for the South and North Areas, respectively, which were refined to reflect current information about the Site. These revised CSMs were used to develop the quantitative exposure assessment of the BHHRA. Complete pathways are indicated with a bold line and check in the potential receptors column. Incomplete pathways are denoted with an “X” and a footnote indicating why the pathway is incomplete.

At the South Area, PCOCs were potentially released from historical Potential Source Areas (PSAs) to the soil and may have migrated to groundwater via leaching through the soil column, and to surface water in the Intracoastal Waterway via overland surface runoff. Once in surface water, some compounds tend to stay dissolved in the water whereas some tend to partition to sediment. Volatilization and fugitive dust generation may have caused PCOCs in soil to migrate within the Site or off-site. Exposure to on-site receptors may also occur directly from contact to the soil. However, based on PCOC data for surface soil samples collected on Lots 19 and 20 directly west of the Site (see Section 2.4.2 of the NEDR for detailed discussion of these data (PBW, 2009)), it does not appear that significant entrainment and subsequent deposition of particulates occurred at the Site or at off-site locations. Once in groundwater, VOCs may

migrate with the groundwater and/or volatilize through the soil pore space and be emitted into outdoor or indoor air.

At the North Area, PCOCs were potentially released from historical PSAs to the soil and/or may have migrated to groundwater. PCOCs may have also migrated from soil to surface water and sediments in the nearby wetlands area via overland surface runoff. Because of the high moisture content and the vegetated nature of the limited surface soils in the North Area, fugitive dust generation is not considered a significant transport pathway for PCOC migration. Once in groundwater, VOCs may migrate with the groundwater and/or volatilize through the soil pore space and be emitted into outdoor or indoor air.

It was assumed, as part of the risk assessment, that these media were potentially contacted by the various hypothetical receptors possibly at the Site and, as such, these exposure pathways were potentially complete. The remainder of this section describes how exposure was quantified for each of these complete exposure pathways.

3.4 QUANTIFICATION OF EXPOSURE

In keeping with EPA guidance (EPA, 1992c), the goal of the exposure assessment was to provide a reasonable, high-end (i.e., conservative) estimate of exposure that focuses on potential exposures in the actual population. This concept is termed the reasonable maximum exposure (RME) approach. This should not be confused with: (1) a worst-case scenario which refers to a combination of events and conditions such that, taken together, produces the highest conceivable exposure; or (2) a bounding estimate that purposefully overestimates exposure (EPA, 1992c). Thus, in accordance with EPA guidance, site-specific exposure assumptions and parameters were used when available and, when not available, assumptions were deliberately chosen to represent a high-end RME estimate (EPA, 1989). A central tendency or average scenario was also evaluated to provide a range of exposures.

Chemical exposure is quantified by the calculation of an intake, or dose, that is normalized to body weight and exposure time of the receptor. A dose is calculated by combining assumptions regarding contact rate (intake amount and time, frequency and duration of exposure) to a contaminated medium with representative chemical exposure point concentrations for the medium of concern at the point of contact. Receptors are chosen based on their exposure patterns that may put them at risk or at a higher risk than other individuals. Intake assumptions, in general, were based on central tendency or RME assumptions determined by EPA (1989; 1991a), or were based on information obtained from site-specific

studies. Reasonable maximum exposure scenarios use a combination of assumptions, such as average values for physical characteristics of the receptors (body weight and corresponding body surface area), UCL values (values at the 90 or 95 percentile of the distribution) for contact rate, and UCL on the mean (95 percent UCL) for the exposure point concentrations. The combination of these factors is assumed to provide an upper-bound estimate of exposure and risk to that particular receptor.

The intake or dose of a particular compound by a receptor is quantified with the generic equation below (EPA, 1989):

$$I = \frac{C \times CR \times EFD}{BW} \times \frac{1}{AT} \quad (\text{Equation 1})$$

where:

- I = the compound intake or dose (mg/Kg BW-day);
- C = the compound concentration (mg/Kg or mg/L);
- CR = contact rate or the amount of contaminated medium contacted per event (L/day or mg/day);
- EFD = the frequency (days/year) and duration (number of years) of exposure days;
- BW = the average body weight of the receptor (Kg); and
- AT = averaging time of the exposure (days); for noncarcinogens, AT equals (ED) x (365 day/year); for carcinogens, AT equals (70 years over a lifetime) x (365 day/year).

This equation calculates an intake that is normalized over the body weight of the individual and the time of the exposure. Because the intake or dose is combined with quantitative indices of toxicity (chemical-specific dose-response information such as reference doses (RfDs) for noncarcinogenic compounds or cancer slope factors (CSFs) for carcinogenic compounds, which is discussed further in Section 4.0) to give a measure of potential risk, the intake or dose must be calculated in a manner that is compatible with the quantitative dose-response information for chemical constituents evaluated in the analysis. Two different types of health effects are considered in this analysis: 1) carcinogenic effects and 2) noncarcinogenic effects (either chronic or subchronic, depending on the receptor's exposure).

For carcinogenic effects, the relevant intake is the total cumulative intake averaged over a lifetime because the quantitative dose-response function for carcinogens is based on the assumption that cancer results from chronic, lifetime exposures to carcinogenic agents. This intake or dose is then averaged over a lifetime to provide an estimate of intake or dose to carcinogens as (mg/Kg-day), which is expressed as a lifetime average daily dose (LADD). Thus, for potentially carcinogenic compounds, the averaging time (AT) is equal to 70 years (EPA, 1989).

Noncarcinogenic effects are evaluated for chronic, subchronic, or acute exposures by receptors to systemic or reproductive toxicants. For noncarcinogenic effects, the relevant intake or dose is based on the daily intake averaged over the exposure period of concern. As defined in EPA guidance (EPA, 1989), an exposure period for toxicity can be either acute (exposure occurring from one event or over one day), subchronic (cumulative exposures occurring from two weeks up to seven years), or chronic (cumulative exposure over seven years to a lifetime in duration). The quantitative dose-response function for noncarcinogenic effects (chronic and subchronic) is based on the assumption that effects occur once a threshold dose is attained from repeated exposure. Therefore, the intake or dose for noncarcinogenic risk assessment is based on an average daily dose (ADD) that is averaged over the duration of exposure. The averaging time for assessing noncarcinogenic effects is equal to the exposure duration for the receptor. In the BHHRA, exposure was assumed to be chronic for all receptors even though some exposures described in this report were intermittent or less than chronic duration.

3.4.1 Estimating the Exposure Point Concentration

The general procedure that is recommended by EPA to estimate a 95% UCL (EPA, 2002b) was used as the EPC to represent the upper end of exposure. EPA's ProUCL Version 4 program (EPA, 2007) was used to analyze dataset distribution and calculate average and 95% UCL concentrations. ProUCL calculates various estimates of the 95% UCL of the mean, and then makes a recommendation on which one should be selected as the best UCL estimate. If the 95% UCL was greater than the maximum detected concentration, the maximum measured concentration was used as the exposure point concentration (EPA, 2002b).

Appendix A provides the ProUCL output when there were sufficient samples to run statistics (soil and sediment). It should be noted that when evaluating exposure from fugitive dust generation, the exposure point concentration was based on surface soil data because it is unlikely that deeper soils (i.e., soils below a depth of 0.5 ft) are transported as wind-borne dust. One-half of the SDL was used for sample measurements below the SDL. There were not enough pond sediment or surface water samples for statistical calculations so average and maximum measured concentrations were used in the evaluation for these media.

Both averages and 95% UCLs were used in the BHHRA to provide a range of exposure point concentrations and are summarized in Tables 1 through 15. The dose estimates using the 95% UCL EPC

were considered to represent reasonable maximum exposure (RME). The average was used to represent the average or central tendency exposure.

3.4.2 Quantifying Intake

To quantify potential exposures associated with the pathways of potential concern, Equation 1 is modified according to the specific exposure routes and intake assumptions.

Incidental Ingestion of Soil. The intake or dose for the incidental ingestion pathway from soil is calculated based on the following equation (EPA, 1989):

$$ADD_{ing} = \frac{Conc_{soil} \times IR \times FI \times AAF \times EF \times ED \times CF}{BW \times AT} \quad (\text{Equation 2})$$

where:

ADD_{ing}	=	average daily intake of compound via ingestion of soil (mg/Kg BW-day);
$Conc_{soil}$	=	exposure concentration in soil (mg/Kg);
IR	=	ingestion rate (mg soil/day);
FI	=	fraction ingested (unitless);
AAF	=	absorption adjustment factor (fraction absorbed);
EF	=	exposure frequency (days/year);
ED	=	exposure duration (years);
CF	=	conversion factor (10^{-6} Kg/mg);
BW	=	body weight (Kg); and
AT	=	averaging time (days).

The exposure concentration in the soil ($Conc_{soil}$) is the concentration of a PCOC at the point of contact. Exposure point concentrations represent random exposure over the exposure unit and were discussed in greater detail in the Section 3.4.1. The ingestion rate (IR) is the amount of soil incidentally ingested per day or event. For soil, the incidental intake values vary according to the receptor and the specific activities or exposure patterns that the receptor is engaged in at the Site.

The fraction ingested (FI) relates to the fraction of soil that is contacted daily from the contaminated area. This is highly dependent on the different activities that an individual is engaged in and the number of hours (fraction of time) spent in the contaminated portions of the site (EPA, 1989). The fraction ingested

was conservatively assumed to be 100 percent. The absorption adjustment factor (AAF) is used in the ingestion pathway to account for differences in relative absorption for the chemical from the test vehicle versus the exposure medium (i.e., soil) and was assumed to be 1.0 unless compound-specific data were available to suggest otherwise. (The test vehicle is the material (e.g., soil, food, or solvent) in which the chemical was administered in the toxicity study.) Body weight (BW) varies according to the age range of the receptor. Adult receptors are assumed to weigh 70 kilograms (Kg), which corresponds to the 50th percentile value for all adults, as recommended by EPA (1989). For receptors other than adults, body weight is dependent on the age of the receptor and is calculated as the time-weighted average body weight using values reported by the *Exposure Factors Handbook* (EPA, 1997a). The exposure frequency (EF) and duration (ED) of the event is based on the particular exposure pattern and activity related to the receptor (EPA, 1997a). The averaging time is 70 years for carcinogenic effects, and for noncarcinogenic effects depends on the frequency and duration of exposure for the particular receptor (EPA, 1989; 1991a).

Dermal Contact with Soil. When calculating intake via dermal contact with soil or sediment, Equation 1 is modified slightly to account for skin surface area, soil-to-skin adherence factors, and chemical-specific absorption factors. An intake or dose is quantified from dermal contact with the equation (EPA, 1989):

$$ADD_{der} = \frac{Conc_{soil} \times SA \times AF \times AAF \times EF \times ED \times CF}{BW \times AT} \quad (\text{Equation 3})$$

where:

ADD _{der}	=	average daily dose from dermal contact with chemical in soil (mg/Kg-day);
Conc _{soil}	=	exposure concentration in soil (mg/Kg);
SA	=	skin surface area available for direct dermal contact (cm ² /event);
AF	=	soil/sediment to skin adherence factor (mg/cm ²);
AAF	=	absorption adjustment factor (unitless)
EF	=	exposure frequency (days or events/year);
ED	=	exposure duration (years)
CF	=	conversion factor (10 ⁻⁶ Kg/mg);
BW	=	body weight (Kg); and
AT	=	averaging time (days).

The exposed skin surface area (SA) is the area or portion of the body exposed for dermal contact. As with many exposure variables, surface area depends on the age and exposure pattern that the receptor is engaged in that relate to repeated or average exposure. Surface area can be predicted based on factors such as activity and types of clothing. Typical exposures via dermal contact for most receptors are generally limited to certain parts of the body (e.g., hands, forearms, head, and neck) since clothing tends to significantly reduce the potential for direct contact with soil (Kissel, 1995). The soil adherence factor (AF) is the density of soil adhering to the exposed fraction of the body. The adherence factor is highly

dependent on the specific activity of the receptor as well as physical properties of the soil (e.g., moisture content, textural class, and organic carbon content) (Kissel et al., 1996). The AAF accounts for the relative absorbance of a chemical between dermal exposure from the environmental medium and oral exposure in the critical toxicity study, which was used to derive the dose-response information for that chemical. Therefore, the AAF is highly chemical-specific and, unless otherwise noted, was assumed to be 1.0. Factors such as body weight, exposure frequency, exposure duration, and averaging time are similar to that discussed above for incidental ingestion.

Inhalation of Volatiles and Fugitive Dusts. An intake or dose from inhalation of vapors or particles emitted from the Site is calculated by modifying Equation 1 to account for the volatilization and/or particulate emission factor and the difference in methodology when evaluating air impacts (i.e., dose was not calculated, but rather an effective air concentration that the receptor may be exposed to was calculated). An effective air concentration was generally calculated using the following equation:

$$EAC = Conc_{soil} \times VF \times EF \times ED / AT \quad (\text{Equation 4})$$

where:

EAC	=	effective air concentration (mg/m ³);
Conc _{soil}	=	exposure point concentration in soil (mg/Kg);
VF	=	volatilization factor (mg/m ³ -air/Kg-soil) and/or particulate emission factor;
EF	=	exposure frequency; describes how often exposure occurs (days/year);
ED	=	exposure duration; describes how long exposure occurs (years); and
AT	=	averaging time; period over which exposure is averaged (days).

A risk assessment from inhalation of volatiles and dusts is different from the quantification of potential risks from dermal contact or incidental ingestion. Risks from inhalation exposure are based on a comparison of a measured or calculated air concentration (effective air concentration) to a risk-based acceptable air concentration, either a reference concentration (RfC) or an inhalation unit risk (IUR) value. Where monitoring data do not exist, an exposure point concentration in air can be calculated based on a volatilization model and/or particulate emissions factor and the exposure point concentration in soil. Surface soil data were used when estimating the air concentration for particulate dust generation.

3.4.3 Exposure Assumptions and Intake Calculations

The exposure assumptions are provided in Tables 19, 20, 21, and 22 for the industrial worker, construction worker, youth trespasser, and contact recreation receptors, respectively. References for the

various assumptions are provided in the tables and citations are listed in Section 8.0. Appendix C provides the detailed spreadsheets for the intake calculations for the different receptors for the South and North Areas of the Site.

Instead of employing a highly uncertain particulate emission factor and fugitive dust dispersion model to evaluate off-site exposure, potential risks from South Area soil to the nearby off-site residential receptor were conservatively evaluated using the residential PCL for 30-acre source area for the soil-to-air pathway (inhalation of volatiles and particulates). Maximum measured concentrations of PCOCs in South Area soils were compared to their respective PCLs as shown in Table 23 and 24. Based on this comparison, it is unlikely that PCOCs contained in soil at the South Area of the Site were emitted off-site at deleterious concentrations.

3.4.4 Vapor Intrusion Pathway for Future On-Site Worker Scenarios

Except for an aboveground storage tank (AST) tank farm, a dry dock, and a former transformer shed, there are currently no structures present on the South or North Areas at the Site. However, future development of the area may result in construction of buildings at the Site. In the event that permanent and enclosed structures are built on-Site in the future, the Johnson and Ettinger Vapor Intrusion Model (J&E VIM) (EPA, 2002a) was used to assess the potential migration of volatile chemicals from groundwater into the breathing space of an overlying building. Exposure estimates are calculated in the model using default exposure parameters for an industrial worker similar to those provided in Table 19 and site-specific soil and hydrogeologic properties. While a construction worker could also be exposed to VOCs migrating from groundwater to outdoor air, that exposure and risk scenario was not calculated separately since it is likely to be less than the industrial worker's exposure under the indoor air scenario since there would be greater dispersion and mixing in the ambient outdoor air that a construction worker would encounter (no dispersion and mixing is assumed with the J&E VIM), and because the construction worker's exposure frequency and duration is less than the industrial worker's.

The input parameters used to run the J&E VIM Version 3.1 followed EPA guidance on the subject and recommended values (EPA, 2002a) that are available on-line at www.epa.gov/oswer/riskassessment/airmodel/johnson_ettinger.htm. Site-specific input variables used in the model are described below. The model was only run for those compounds that are considered volatile since non-volatile compounds would not migrate from the groundwater to the overlying soil pore space and to ambient air via this pathway. As noted previously, a restrictive covenant is currently in place for

Lots 55, 56, and 57 and requires any building design to preclude vapor intrusion. Thus, this evaluation represents a conservative assessment of the vapor intrusion pathway for these lots.

The site-specific variables used in the J&E model were determined from information gathered during previous Site investigation and presented in the NEDR (PBW, 2009). Depth below grade to the bottom of a hypothetical enclosed space floor was assumed to be 15 cm, or the thickness of a typical slab (basement construction was not considered due to the geographic location of the Site). Depth below grade to the water table was conservatively estimated to be 5 feet (152 cm) based on water gauging data from both North and South Area monitoring wells. Clay (USCS code CL) was selected as the soil type directly above the water table, which is the dominant soil type in shallow soils at both the North and South Areas as indicated on the boring logs provided in NEDR (PBW, 2009). The average soil/groundwater temperature used in the model was 25° C based on the geographical location of the site and regional climatic conditions.

Both average and RME EPCs were used in the calculations to provide a range of exposure and potential risks. These values are listed in Tables 25 and 26. Estimated risks are provided and discussed in Section 5.0.

4.0 TOXICITY ASSESSMENT

The toxicity assessment provides a description of the relationship between a dose of a chemical and the anticipated incidence of an adverse health effect (Preuss and Ehrlich, 1987 and EPA, 1989). The purpose of the toxicity assessment is to provide a quantitative estimate of the inherent toxicity of PCOCs to incorporate into the risk characterization. Toxicity values are derived from the quantitative dose response association and are correlated with the quantitative exposure assessment in the risk characterization.

For risk assessment purposes, toxic constituent effects are separated into two categories of toxicity: carcinogenic effects and noncarcinogenic effects. This division relates to the EPA policy that the mechanisms of action for these endpoints differ. Generally, the EPA has required that potentially carcinogenic chemicals be treated as if minimum threshold doses do not exist (EPA, 1986), whereas noncarcinogenic effects are recognized to have a threshold below which toxicity is unlikely.

4.1 EXPOSURE ROUTE-SPECIFIC TOXICITY CRITERIA

In deriving toxicity criteria, EPA methodologies consider the route of administration (or exposure) of the test chemical in toxicity or epidemiological studies. Typically oral RfDs and oral CSFs are derived from toxicity studies with oral administration or exposure route, and RfCs or inhalation unit risks are derived from inhalation toxicity studies. While one could attempt to extrapolate an inhalation toxicity criterion to the oral pathway or visa versa, this practice is not recommended because there can be a great deal of uncertainty introduced (EPA, 1989). Therefore, in the BHHRA, oral RfDs were not extrapolated to provide toxicity values for inhalation pathways. Quantitative risk evaluation of the inhalation exposure pathways was conducted only for those chemicals that have reference toxicity values specifically from inhalation administration.

On the other hand, EPA has not derived specific toxicity criteria for the dermal exposure pathway. This presents a complication because oral and inhalation toxicity criteria are based on administered dose and not absorbed dose while dermal exposure pathways consider the absorbed dose (i.e., how much of the chemical in soil or water crosses the skin barrier and is absorbed by the body). Per EPA (1989), the oral RfD or oral CSF can be applied in evaluation of the dermal exposure pathway following adjustment of the oral toxicity criteria for gastrointestinal absorbance. In later guidance (EPA, 2004b), EPA recommends adjusting oral toxicity criteria by gastrointestinal absorbance factors if gastrointestinal absorbance of the chemical in the vehicle of administration in the critical study is less than 50 percent. Generally, organic

chemicals are assumed to be relatively bioavailable in oral and gavage toxicity studies and, thus, the administered dose is likely to be similar to absorbed dose. Therefore, no adjustment of oral toxicity criteria is recommended for organic PCOCs (EPA, 2004b). EPA recommends adjusting oral toxicity criteria for a number of inorganic constituents based on the possibility of low gastrointestinal absorbance in the critical study as shown in Exhibit 4-1 of the associated guidance (EPA, 2004b). It should be noted that none of the PCOCs quantitatively evaluated in the BHHRA are recommended for the adjustment described above.

4.2 CARCINOGENIC EFFECTS

Potential carcinogenic effects resulting from human exposure to constituents are estimated quantitatively using cancer slope factors (CSFs), which represent the theoretical increased risk per milligram of constituent intake/kilogram body weight/day (mg/Kg-day^{-1}) or unit risks, which are the theoretical increased risks per exposure concentration. CSFs or unit risks are typically derived for “known or probable” human carcinogens. CSFs or unit risks are used to estimate a theoretical upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular lifetime daily dose of a potential carcinogen. Constituents that are believed to be carcinogenic may also have non-cancer effects. Potential health risks for these constituents are evaluated for both cancer and other types of effects as described below.

4.3 NONCARCINOGENIC EFFECTS

Unlike carcinogenic effects, it is widely accepted that noncarcinogenic biological effects of chemical substances occur only after a threshold dose is achieved (Klaassen et al., 2007). This threshold concept of noncarcinogenic effects assumes that a range of exposures up to some defined threshold can be tolerated without appreciable risk of harm. Adverse effects may be minimized at concentrations below the threshold by pharmacokinetic processes, such as decreased absorption, distribution to non-target organs, metabolism to less toxic chemical forms, and excretion (Klaassen et al., 2007).

Reference dose (RfD) values and reference concentrations (RfCs) are developed by the EPA RfD Work Group on the basis of a wide array of noncarcinogenic health effects. The RfD and RfC are estimates of the daily maximum level of exposure to human populations (including sensitive subpopulations) that are likely to be without an appreciable risk of deleterious effects during a lifetime (EPA, 1989). RfDs are expressed in units of daily dose (mg/Kg-day) while RfCs are expressed as an air concentration (mg/m^3). Both incorporate uncertainty factors to account for limitation in the quality or quantity of available data.

4.4 SOURCES OF TOXICITY CRITERIA

There are a variety of toxicity databases that regulatory agencies rely on for the purposes of quantifying the toxicity of chemicals in the environment. Per EPA (1989 and 2003), the primary source (i.e., “Tier 1”) for toxicity information in the risk assessment should be EPA’s Integrated Risk Information System (IRIS) (EPA, 2008). According to a recent OSWER directive (EPA, 2003), that revises the human health toxicity value hierarchy, if RfDs for noncarcinogenic compounds and CSFs for possible carcinogens are not available in IRIS, the “Tier 2” toxicity resource is the EPA’s database of Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV). The “Tier 3” resources that can be consulted if IRIS and PPRTV databases lack relevant toxicity criteria include the Health Effects Assessment Summary Tables (EPA, 1997b) and the Centers for Disease Control’s Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs).

The toxicity criteria used in the BHHRA are provided in Appendix D, along with the risk calculations. All toxicity values were obtained from EPA’s IRIS on-line database, as accessed during December 2008.

5.0 RISK CHARACTERIZATION

Risk characterization is the integration of the exposure and toxicity information to make quantitative estimates and/or qualitative statements regarding potential risk to human health. This section describes the risk characterization process for carcinogenic and noncarcinogenic PCOCs.

5.1 POTENTIAL CARCINOGENIC RISKS

Potential carcinogenic effects are characterized in terms of the excess probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen. For chemicals that exhibit carcinogenic effects, EPA has developed a model that is based on the theory that one or more molecular events as a result of exposure to a potential carcinogenic compound can evoke changes in a single cell or a small number of cells that can lead to tumor formation. This non-threshold theory of carcinogenesis suggests that any level of exposure to a carcinogen can result in some finite possibility of generating the disease. It should be noted that this is a very conservative approach and EPA's more recent Guidelines for Cancer Risk Assessment (EPA, 2005b) recognize that there are "threshold" carcinogens as well.

To characterize the potential for carcinogenic effects, a lifetime average daily dose (LADD) is combined with a CSF to calculate a probability that an individual would develop cancer over a lifetime of exposure to a specific PCOC, with the following equation:

$$\text{Risk} = \text{LADD} \times \text{CSF} \quad (\text{Equation 5})$$

All risk estimates are summed for the receptor by media to provide a theoretical excess lifetime cancer risk. Theoretical excess lifetime cancer risks are evaluated based on an acceptable cancer risk range of 1×10^{-6} to 1×10^{-4} . EPA (1991b) indicates that carcinogenic effects at a site should first be evaluated based on the 1×10^{-4} cancer risk levels, but depending on site-specific conditions, a range of 1×10^{-6} to 1×10^{-4} may be used. Typically, cancer risks less than 1×10^{-6} are considered *de minimis* and acceptable while cancer risks less than 1×10^{-4} are considered acceptable (EPA, 1991b).

The BHHRA evaluated site-specific exposures based on realistic current and possible future land use. All cancer risk estimates fell within the EPA cancer risk range of 10^{-6} to 1×10^{-4} or less, except for the industrial worker scenario at the North Area. Exposure from the vapor intrusion pathway for PCOCs in

groundwater for a hypothetical industrial worker employed in a building sited at the North Area resulted in a cancer risk greater than 1×10^{-4} , as shown in Table 26. Table 27 provides a summary of the cancer risk estimates for each scenario using average and RME assumptions for the soil pathways. Detailed spreadsheets containing the risk calculations are provided in Appendix D by scenario and media.

5.2 POTENTIAL NONCARCINOGENIC HAZARD QUOTIENTS

For noncarcinogenic compounds, a potential hazard is expressed as a hazard quotient (HQ), which is the ratio of the average daily dose (ADD) for a site-specific receptor to an acceptable dose (or RfD) for that compound. The HQ is calculated as follows

$$HQ = ADD/RfD \quad (\text{Equation 6})$$

An RfD is developed with the assumption that the degree of toxicity of noncarcinogenic compounds is based on the ability of organisms to repair and detoxify after exposure to a compound. The repair and detoxification mechanisms must be exceeded by some critical concentration (threshold) before the health effect is manifested. This threshold view holds that a range of exposures from just above zero to some finite value (i.e., the RfD) can be tolerated by an individual without an appreciable risk of adverse effects.

HQs are summed for all chemical intakes to yield a hazard index (HI) for each exposure pathway. An HI equal to or less than 1 indicates that no adverse noncarcinogenic health effects are expected to occur from cumulative exposure to multiple chemicals and exposure pathways. An HI greater than 1 provides an indication that such effects may occur, especially in sensitive subpopulation, but does not provide a prediction of the severity or probability of the effects. An HI above 1 indicates the need for further evaluation. For example, effects of different chemicals are not necessarily additive (although the HI approach assumes additivity), nor do all chemicals affect the same target organ. Thus, EPA recommends that if an HI exceeds 1, further evaluation should occur to categorize hazards based on chemical-specific and route-specific toxicity (e.g., which chemicals act on the same target organ, by which route of entry, etc.) (EPA, 1989).

The BHHRA evaluated site-specific exposures based on realistic current and possible future land use. Table 27 provides a summary of the HIs for each scenario using average and RME assumptions for the soil pathways. None of the HIs for the soil exposure pathways exceeded EPA's target hazard index of 1. Exposure from the vapor intrusion pathway from PCOCs in groundwater for a hypothetical industrial

worker employed in a building sited at the North Area resulted in an HI greater than 1, as shown in Table 26. Detailed spreadsheets containing the risk calculations are provided in Appendix D by scenario.

It should be noted that due to lead's unique toxicological properties, noncancer risk estimates could not be calculated similarly to the other noncarcinogenic PCOCs. However, none of the measured concentrations of lead in Site soil exceeded EPA's screening level for industrial properties of 800 mg/kg (EPA, 2004a). Thus, it is unlikely that lead at the Site poses an unacceptable risk.

5.3 CONTACT RECREATION SCENARIO

Exposure to sediment and surface water by the youth trespasser and contact recreation receptor were evaluated using TCEQ contact recreation PCLs for these media. None of the PCOCs detected in these media exceeded their respective PCLs (see Tables 4, 5, 6, 7, 11, 12, 13, and 14). As such, exposure to PCOCs in these media is unlikely to result in an adverse health risk.

5.4 OFF-SITE RESIDENTIAL SCENARIO

Off-site residential receptor risks were estimated by comparing PCOC concentrations in on-Site soil samples to their respective TCEQ's PCLs that were developed to evaluate exposure to air emissions from particulate dust and VOCs emitted from contaminated soil. This approach is conservative since diluting effects of off-site migration and dispersion were not considered. Even so, unacceptable risks are not expected since none of the compounds measured in South Area soils exceeded the screening criteria (see Tables 23 and 24).

5.5 FUTURE ON-SITE INDUSTRIAL WORKER VAPOR INTRUSION PATHWAY RISK ESTIMATES

The average groundwater concentration and RME EPC established for each compound at the South and North Areas was entered into the J&E VIM to determine the "Incremental Risk from Vapor Intrusion to Indoor Air, Carcinogen (unitless)" and "Hazard Quotient from Vapor Intrusion to Indoor Air, Noncarcinogen (unitless)". The results of this evaluation are presented in Tables 25 and 26 for the North Area and South Area, respectively, and suggest that, under the conservative assumptions of the J&E VIM, a potential unacceptable risk is likely at the North Area in the event that a building is constructed over the

Zone A groundwater plume and vapor intrusion occurs similar to the model's predictions. As noted previously, this conservative evaluation does not consider the restrictive covenants for Lots 55, 56, and 57 that require building design to exclude vapor intrusion.

6.0 UNCERTAINTY ASSESSMENT

Uncertainties are inherent in every aspect of a quantitative risk assessment. The inclusion of site-specific factors can decrease uncertainty, although significant uncertainty persists in even the most site-specific risk assessments. Worst-case assumptions and default values, which conform to EPA guidance (EPA, 1989), add conservatism to human health risk assessments. This conservatism is intentionally included in order to tilt the assessment toward over-prediction of risk and hence protection of human health. Therefore, it is important to the risk management decision-making process that the sources of uncertainty are provided.

A careful and comprehensive analysis of the critical areas of uncertainty in a risk assessment is an important part of the risk assessment process. EPA guidance (EPA, 1989) stresses the importance of providing a complete analysis of uncertainties so that risk management decisions take these uncertainties into account when evaluating risk assessment conclusions. The uncertainty analysis provides a context for better understanding the assessment conclusions by identifying the uncertainties that have most significantly affected the assessment results. Therefore, sources of uncertainty in the identification of PCOCs, exposure assessment, and toxicity assessment sections of the risk assessment report are identified and qualitatively evaluated in this section.

6.1 DATA ANALYSIS UNCERTAINTIES

Data collected at the Site satisfied the goals described in the Work Plan (PBW, 2006a) and, thus, adequately characterized the nature and extent of contamination at this Site. As described in the NEDR (PBW, 2009), hundreds of samples of soil, sediment, groundwater and surface water were collected at the South Area, North Area, Intracoastal Waterway, and background soil, sediment, and surface water locations. Characterization was initially conducted for the entire Site and continued at certain areas if a screening level was exceeded.

Overall, the data were determined to be of high quality. Data were collected and analyzed in accordance with approved procedures specified in the FSP (PBW, 2006b) and were validated in accordance with approved validation procedures specified in the QAPP (PBW, 2006c). Very few of the data for any of the analytes were found to be unusable (i.e., “R-flagged”). In instances where data were unusable, the analysis was conducted again (when possible) and the R-flagged data was not used. Some of the data are qualified (i.e., “J-flagged”) as estimated because the measured concentration is above the sample

detection limit but below the sample quantitation limit and/or due to minor quality control deficiencies. According to the *Guidance for Data Useability in Risk Assessment (Part A)* (EPA, 1992b), data that are qualified as estimated can be used for risk assessment purposes. Data quality was discussed in greater detail in the NEDR (PBW, 2009).

6.2 EXPOSURE ANALYSIS UNCERTAINTIES

The RAGS (EPA, 1989) risk assessment approach to exposure assessments generally requires standard hypothetical exposure scenarios rather than realistic site-specific evaluation of exposure, and this conservative default approach was used for the future industrial and construction worker scenarios. Under this approach, if a chemical is found to be present at a site, it is assumed that exposure to that chemical will occur regardless of whether that exposure is realistic or likely. Uncertainties associated with the exposure assessment included calculation of EPCs and selection of exposure parameters. For example, the intake equations are based on several 95th percentile values. When multiplied together, these data compound the uncertainties in the exposure assessments and result in estimated intakes (and resultant cancer risks) that likely estimate exposure well over the 95th percentile.

It is difficult to assess the likelihood of any of the hypothetical future scenarios occurring (i.e., future construction worker or future industrial worker) nor is it possible to know the extent, if any, that trespassers and contact recreation receptors are exposed to PCOCs at the Site. It was assumed that the youth trespasser accesses the Site once a week for twelve years. It was assumed that the contact recreation scenario receptor visits the Site for 39 times per year for 25 years. The exposure assumptions used for all scenarios were chosen to purposefully overestimate exposure in order to err on the side of protection. For the current scenarios (i.e., the youth trespasser and the contact recreation scenario) it appears that these represent a bounding estimate since exposure is likely to be much less.

The screening conducted to evaluate off-site impacts from particulate dust generation and VOC emissions and migration was very conservative because it did not assume any dispersion during transport. Despite that very conservative assumption, no adverse risks to off-site residents were likely.

Soil ingestion rates for adults and older youth are highly uncertain. Because the ingestion rate is a very sensitive parameter in the intake equation, uncertainty and variability in this assumption has a large impact on the dose estimate. This is especially relevant for the construction worker scenario when an

enhanced ingestion rate was used. The uncertainty related to this value is tremendous given the study design, small study population, and limited exposure length that are the basis for the soil ingestion rate.

Assumptions regarding bioavailability of metals in soil can significantly influence risk estimates. EPA typically assumes that the bioavailability of compounds from soil is equal to that observed in the toxicity studies used to derive oral toxicity factors but this is most often not the case. Rather, toxicity studies are often, if not always, conducted using a concentration of a compound in either food or water.

Bioavailability was assumed to be 100% (i.e., AAF was 1.0) although it is well known that metals and some organic compounds bound to soil are less than 100% bioavailable. This assumption leads to an overestimation of risks, which can be significant.

For surface water, groundwater, and sediment in the ponds, maximum concentrations were selected as the EPC for purposes of evaluating human health risks. This is likely to be a conservative approach since there were other, lower concentrations, also measured for these media.

6.3 TOXICITY ASSESSMENT UNCERTAINTIES

The studies/basis for the toxicity information and the use of this information generate uncertainty. Toxicity assessments for many of the PCOCs in the BHHRA involve the extrapolation of results from studies on animals. The following are standard assumptions applied by the EPA when extrapolating the results of studies of carcinogenicity in animals to humans.

- Any constituent showing carcinogenic activity in any animal species will also be a human carcinogen.
- There is no threshold dose for carcinogens.
- The results of the most sensitive animal study are appropriate to apply to humans.
- Humans are more sensitive than the most sensitive animal species on a body weight basis.

Uncertainties are introduced in animal to human extrapolation and high to low dose extrapolation. Mathematical models are used by EPA to estimate the possible responses due to exposure to chemicals at levels far below those tested in animals. These models contain several limitations, which should be considered when the results (e.g., risk estimates) are evaluated. Primary among these limitations is the uncertainty in extrapolation of results obtained in animal research to humans and the shortcomings in extrapolating responses obtained from high-dose research studies to estimate responses at very low doses.

For example, humans are typically exposed to environmental chemicals at levels that are less than a thousandth of the lowest dose tested in animals. Such doses may be easily degraded or eliminated by physiological internal mechanisms that are present in humans (Ames, 1987).

Additionally, approaches typically used for designating RfDs are highly conservative. For example, EPA (1989) applies a factor of 10 to a No-Observable-Adverse-Effect-Level (NOAEL) for a compound in an animal study for animal-to-human extrapolation. An additional factor of 10 is applied for inter-individual variation in the human population, and additional factors of 10 may be applied to account for limitations in data quality or incomplete studies. Frequently, RfDs are derived from animal studies that have little quantitative bearing on potential adverse effects in humans. Some of this uncertainty may be reduced if the absorption, distribution, metabolic fate, and excretion parameters of a compound are known.

Potential long-term, or chronic, exposures are typically evaluated in risk assessments for Superfund sites, and chronic RfDs and RfCs are the appropriate toxicity criteria to apply to chronic exposure scenarios (chronic exposure is defined in EPA, 1989 as greater than or equal to seven years). The BHHRA includes a construction worker scenario, which was assumed to be of a shorter duration than seven years and is, therefore, considered a subchronic exposure scenario. In some cases, EPA provides recommended subchronic RfDs which are typically 10 times higher than chronic values. Only chronic toxicity values were used in the risk assessment, which imparts conservatism in the construction worker scenario.

6.4 RISK CHARACTERIZATION UNCERTAINTIES

The only instance where uncertainty may have been introduced into the risk assessment that is not considered conservative was when toxicity values or screening criteria were not available. This was only an issue when evaluating impacts to off-site receptors since there are not inhalation toxicity values for many of the compounds (or TCEQ PCLs) and, as such, a comparison could not be made. It is believed that this is insignificant since: 1) there are few VOCs present in soil at the South Area; 2) the VOCs that are present were measured in low concentrations; and 3) surficial soil testing for lead on Lots 19 and 20 did not suggest that off-site migration via fugitive dust generation was a significant concern.

It was estimated that risks associated with VOC emissions from shallow Zone A groundwater to future inhabitants of buildings were above EPA's target risk goals. It should be noted that this is a highly uncertain pathway with the use of many default assumptions to calculate risks since currently the pathway is incomplete (i.e., there is no building or no worker at the Site 250 days per year for exposure to occur).

Likewise, conservative assumptions were made about the slab and slab integrity and contaminant transport in the J&E VIM that would greatly affect the resulting risk estimates. Therefore, it is advisable to consider the results of this analysis in light of the substantial amount of uncertainty in the underlying assumptions of this pathway.

6.5 IMPACT OF UNCERTAINTIES

As described in this section, efforts were made in the BHHRA to purposefully err on the side of conservatism in the absence of site-specific information. It is believed that the overall impact of the uncertainty and conservative nature of the evaluation results in an overly protective assessment. Therefore, for scenarios with risks and HIs within or below the Superfund risk range goal and target HI, it can be said with confidence that these environmental media and areas do not present an unacceptable risk.

7.0 CONCLUSIONS

The primary objective of this BHHRA was to evaluate the possible risks associated with PCOCs in environmental media on human receptors at the Gulfco Marine Maintenance Site. This information will be used to help guide future risk management decisions at the Site. The risk assessment methodology used to conduct this analysis was based on the approach described by EPA in various supplemental and associated guidance documents as documented throughout the report.

Data were segregated by media and by location (e.g., North Area soil and South Area soil; Intracoastal Waterway sediment and Wetlands sediment) and distribution testing was performed. Exposure point concentrations were estimated for all PCOCs for both central tendency (average) and RME (95% UCL) exposures using EPA's ProUCL program.

Five different exposure scenarios were quantitatively evaluated for the thirteen different potentially contaminated media identified at the Site. Exposure scenarios were developed to describe current and potential future land use by various human receptors and included a future industrial worker, future construction worker, current youth trespasser, current contact recreation receptor, and current off-site residential receptor. Exposure and risks were calculated for both central tendency and RME scenarios.

The risk assessment showed that there were not unacceptable cancer risk or noncancer hazard indices for any of the current or future exposure scenarios except for future exposure to an indoor industrial worker if a building is constructed over impacted groundwater in the North Area. Potential cancer risks in the North Area using maximum shallow Zone A groundwater concentrations and the J&E VIM were predicted to be greater than 1×10^{-4} while the HIs were estimated to be greater than 1. It should be noted that this scenario was evaluated despite the current restrictive covenant on Lots 55, 56, and 57 that require future building design to preclude vapor intrusion, which would effectively make this pathway incomplete. Therefore, current risks at the Site are acceptable given the low levels of potential exposure. Estimated risks from Zone A groundwater at the South Area were below EPA's goals and, therefore, adverse risks associated with the vapor intrusion pathway are unlikely in this area.

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TABLE 1
EXPOSURE POINT CONCENTRATIONS (mg/kg)
SOUTH AREA SURFACE SOIL*

Chemical of Interest*	Average	Max Detection	Min Detection	TotSoil _{comb} ⁽¹⁾	EPA Region 6 Soil Screening Criteria ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
2-Methylnaphthalene	0.0293	0.501	0.0106	2.5E+03	---	0.0784	97.5% Chebyshev	22 of 83
4,4'-DDD	0.0007894	0.0243	0.00264	1.0E+02	1.1E+01	0.0029	97.5% Chebyshev	5 of 83
4,4'-DDE	0.0019	0.0693	0.000428	7.3E+01	7.8E+00	0.0074	97.5% Chebyshev	17 of 83
4,4'-DDT	0.0038	0.0625	0.000281	6.8E+01	7.8E+00	0.014	99% Chebyshev	37 of 83
Acenaphthene	0.0595	1.69	0.0113	3.7E+04	3.3E+04	0.197	97.5% Chebyshev	26 of 83
Acenaphthylene	0.0382	0.935	0.0184	3.7E+04	---	0.113	97.5% Chebyshev	19 of 83
Aluminum	5335	15200	414	5.70E+05	1.0E+05	5946	95% Student's-t	83 of 83
Anthracene	0.0961	2.46	0.0112	1.9E+05	1.0E+05	0.297	97.5% Chebyshev	37 of 83
Antimony	1.118	5.14	0.2	3.1E+02	4.5E+02	1.959	97.5% Chebyshev	72 of 83
Aroclor-1254	0.137	7.98	0.00334	---	8.3E-01	0.726	97.5% Chebyshev	13 of 85
Arsenic	3.735	24.3	0.26	2.0E+02	1.8E+00	4.535	95% Approx. Gamma	71 of 83
Barium	345.2	2180	18.6	8.90E+04	7.9E+04	415.1	95% H-UCL	83 of 83
Benzo(a)anthracene	0.345	5.02	0.0286	2.4E+01	2.3E+00	1.211	99% Chebyshev	30 of 83
Benzo(a)pyrene	0.457	4.57	0.0103	2.4E+00	2.3E-01	1.457	99% Chebyshev	65 of 83
Benzo(b)fluoranthene	0.582	5.42	0.0408	2.4E+01	2.3E+00	1.638	95% H-UCL	61 of 83
Benzo(g,h,i)perylene	0.324	4.24	0.00989	1.9E+04	---	1.095	99% Chebyshev	51 of 83
Benzo(k)fluoranthene	0.24	4.25	0.0195	2.4E+02	2.3E+01	0.651	97.5% Chebyshev	33 of 83
Beryllium	0.408	4.6	0.014	2.5E+02	2.2E+03	0.487	95% Approx. Gamma	82 of 83
Boron	4.662	54.4	2.43	1.9E+05	1.0E+05	9.663	97.5% Chebyshev	34 of 83
Butyl Benzyl Phthalate	0.0187	0.297	0.0129	1.00E+04	2.4E+02	0.0373	95% Chebyshev	6 of 83
Cadmium	0.464	9.71	0.023	8.5E+02	5.6E+02	1.71	99% Chebyshev	50 of 83
Carbazole	0.0612	1.54	0.0104	9.5E+02	9.6E+01	0.193	97.5% Chebyshev	29 of 83
Chromium	16.08	136	3.37	5.7E+04	5.0E+02	17.45	95% H-UCL	83 of 83
Chrysene	0.409	4.87	0.00932	2.4E+03	2.3E+02	1.322	99% Chebyshev	56 of 83
Cobalt	3.705	16	0.049	2.70E+02	2.1E+02	4.781	95% Chebyshev	82 of 83
Copper	27.98	216	1.55	3.7E+04	4.2E+04	32.45	95% H-UCL	83 of 83
Dibenz(a,h)anthracene	0.155	1.64	0.0639	2.4E+00	2.3E-01	0.363	97.5% Chebyshev	36 of 83
Dibenzofuran	0.0378	0.821	0.0167	2.7E+03	1.7E+03	0.111	97.5% Chebyshev	17 of 83
Dieldrin	0.000997	0.0205	0.000243	1.1E+00	1.2E-01	0.003	97.5% Chebyshev	21 of 83
Di-n-butyl Phthalate	0.048	0.753	0.0368	1.6E+04	6.8E+04	0.0967	95% Chebyshev	9 of 83
Endosulfan Sulfate	0.002	0.0713	0.000456	4.1E+03	---	0.0077	97.5% Chebyshev	17 of 83
Endrin Aldehyde	0.0023	0.0738	0.000497	2.0E+02	---	0.0084	97.5% Chebyshev	22 of 83
Endrin Ketone	0.0016	0.02	0.000469	1.8E+02	---	0.004	97.5% Chebyshev	18 of 83
Fluoranthene	0.799	14.2	0.0133	2.5E+04	2.4E+04	2.656	95% H-UCL	59 of 83
Fluorene	0.0515	1.11	0.00945	2.5E+04	2.6E+04	0.155	97.5% Chebyshev	28 of 83
gamma-Chlordane	0.00082679	0.0156	0.00071	5.1E+01	---	0.0025	97.5% Chebyshev	8 of 83
Indeno(1,2,3-cd)pyrene	0.47	6.49	0.0634	2.4E+01	2.3E+00	1.115	97.5% Chebyshev	63 of 83
Iron	16285	77100	3450	---	1.0E+05	17845	95% H-UCL	83 of 83
Lead	69.61	643	2.82	1.6E+03	8.0E+02	84.5	95% H-UCL	83 of 83
Lithium	7.856	28	0.65	1.90E+03	2.3E+04	9.055	95% Approx. Gamma	83 of 83
Manganese	257.4	892	59.3	2.4E+04	3.5E+04	281.1	95% Student's-t	83 of 83
Mercury	0.0227	0.66	0.0032	3.3E+00	3.4E+02	0.0254	95% H-UCL	37 of 83
Molybdenum	1.306	8.42	0.098	4.5E+03	5.7E+03	1.645	95% Approx. Gamma	71 of 83
Nickel	11.64	36.7	2.84	7.9E+03	2.3E+04	12.54	95% Approx. Gamma	83 of 83
Phenanthrene	0.512	12.6	0.0139	1.9E+04	---	2.198	99% Chebyshev	57 of 83
Pyrene	0.533	8.47	0.0121	1.9E+04	3.2E+04	1.366	95% H-UCL	57 of 83
Strontium	70.61	527	16.5	4.9E+05	1.0E+05	101.2	95% Chebyshev	83 of 83
Tin	0.611	4.95	0.52	4.0E+05	---	0.991	95% Chebyshev	23 of 83
Titanium	29.8	645	11.5	1.0E+06	---	63	95% Chebyshev	83 of 83
Vanadium	13.76	45.6	5.42	2.3E+03	1.1E+03	14.84	95% Approx. Gamma	83 of 83

Notes:

* Surface soil was collected from 0 to 0.5 ft. below ground surface.

* Chemicals of Interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - TotSoil_{comb} PCL = TCEQ protective concentration Level for 30 acre source area Commercial/Industrial total soil combined pathway (includes inhalation; ingestion; dermal pathways).

⁽²⁾ - From EPA's "Region 6 Human Health Medium-Specific Screening Levels 2004-2005". Industrial Outdoor Worker.

⁽³⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 2
EXPOSURE POINT CONCENTRATIONS (mg/kg)
SOUTH AREA SOIL*

Chemical of Interest*	Average	Max Detection	Min Detection	Total Soil Comb ⁽¹⁾	EPA Region 6 Soil Screening Criteria ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
1,3,5-Trimethylbenzene	0.099	4.36	0.000267	8.3E+01	7.8E+01	0.532	97.5% Chebyshev	9 of 83
2-Butanone	0.00412	0.0226	0.000992	7.3E+04	3.4E+04	0.00925	97.5% Chebyshev	4 of 83
2-Hexanone	0.00406	0.0207	0.00109	7.9E+01	---	0.0164	97.5% Chebyshev	8 of 83
2-Methylnaphthalene	0.0698	7.21	0.0106	2.5E+03	---	0.341	97.5% Chebyshev	32 of 166
4,4'-DDD	0.00766	1.12	0.000369	1.0E+02	1.1E+01	0.0498	97.5% Chebyshev	21 of 166
4,4'-DDE	0.0017	0.0693	0.000428	7.3E+01	7.8E+00	0.0054	97.5% Chebyshev	22 of 166
4,4'-DDT	0.0037	0.113	0.000281	6.8E+01	7.8E+00	0.0125	99% Chebyshev	68 of 166
Acenaphthene	0.0419	1.69	0.0113	3.7E+04	3.3E+04	0.115	97.5% Chebyshev	35 of 166
Acenaphthylene	0.042	1.2	0.0172	3.7E+04	---	0.114	97.5% Chebyshev	37 of 166
Acetone	0.0145	0.16	0.031	8.1E+03	1.0E+05	0.0491	99% Chebyshev	10 of 83
Aluminum	6452	15700	414	5.70E+05	1.0E+05	6914	95% Student's-t	166 of 166
Anthracene	0.0874	2.46	0.0112	1.9E+05	1.0E+05	0.21	97.5% Chebyshev	65 of 166
Antimony	1.023	5.51	0.2	3.1E+02	4.5E+02	1.576	97.5% Chebyshev	144 of 166
Aroclor-1254	0.205	11.5	0.00334	---	8.3E-01	0.74	97.5% Chebyshev	25 of 170
Arsenic	3.331	24.3	0.23	2.0E+02	1.8E+00	4.916	97.5% Chebyshev	139 of 166
Barium	237.4	2180	18.6	8.90E+04	7.9E+04	330.4	95% Chebyshev	166 of 166
Benzene	0.004	0.0221	0.000339	1.11E+02	1.6E+00	0.0065	97.5% Chebyshev	72 of 83
Benzo(a)anthracene	0.268	5.02	0.0118	2.4E+01	2.3E+00	0.859	99% Chebyshev	44 of 166
Benzo(a)pyrene	0.347	4.88	0.00999	2.4E+00	2.3E-01	1.008	99% Chebyshev	113 of 166
Benzo(b)fluoranthene	0.466	5.97	0.0408	2.4E+01	2.3E+00	1.256	99% Chebyshev	102 of 166
Benzo(g,h,i)perylene	0.251	4.24	0.00989	1.9E+04	---	0.545	97.5% Chebyshev	81 of 166
Benzo(k)fluoranthene	0.157	4.25	0.0158	2.4E+02	2.3E+01	0.378	97.5% Chebyshev	45 of 166
Beryllium	0.465	4.6	0.014	2.5E+02	2.2E+03	0.668	97.5% Chebyshev	165 of 166
Boron	4.811	54.4	2.43	1.9E+05	1.0E+05	7.387	97.5% Chebyshev	72 of 166
Butyl Benzyl Phthalate	0.0203	0.617	0.0129	1.00E+04	2.4E+02	0.0392	95% Chebyshev	10 of 166
Cadmium	0.335	9.71	0.023	8.5E+02	5.6E+02	0.751	97.5% Chebyshev	93 of 166
Carbazole	0.0459	1.54	0.0104	9.5E+02	9.6E+01	0.118	97.5% Chebyshev	42 of 166
Carbon Disulfide	0.0012	0.028	0.000987	7.2E+03	7.2E+02	0.004	97.5% Chebyshev	13 of 83
Chromium	13.53	136	2.03	5.7E+04	5.0E+02	17.75	95% Chebyshev	166 of 166
Chrysene	0.327	4.87	0.00901	2.4E+03	2.3E+02	0.938	99% Chebyshev	93 of 166
Cobalt	4.144	16	0.049	2.70E+02	2.1E+03	4.407	95% Student's-t	165 of 166
Copper	24.26	487	0.13	3.7E+04	4.2E+04	46.92	97.5% Chebyshev	164 of 166
Cyclohexane	0.266	21.7	0.000626	4.2E+04	6.8E+03	1.898	97.5% Chebyshev	47 of 83
Dibenz(a,h)anthracene	0.113	1.64	0.0619	2.4E+00	2.3E-01	0.236	97.5% Chebyshev	56 of 166
Dibenzofuran	0.0309	0.821	0.0167	2.7E+03	1.7E+03	0.0709	97.5% Chebyshev	23 of 166
Dieldrin	0.00090075	0.0205	0.000243	1.1E+00	1.2E-01	0.0021	97.5% Chebyshev	33 of 166
Di-n-butyl Phthalate	0.0391	0.753	0.0311	1.6E+04	6.8E+04	0.0657	95% Chebyshev	11 of 166
Endosulfan Sulfate	0.0013	0.0713	0.0713	4.1E+03	---	0.0042	97.5% Chebyshev	21 of 166
Endrin Aldehyde	0.0019	0.0738	0.000497	2.0E+02	---	0.0055	97.5% Chebyshev	31 of 166
Endrin Ketone	0.0013	0.02	0.000469	1.8E+02	---	0.0029	97.5% Chebyshev	25 of 166
Ethylbenzene	0.0038	0.105	0.000654	1.0E+04	2.3E+02	0.0127	97.5% Chebyshev	47 of 83
Fluoranthene	0.594	14.2	0.0133	2.5E+04	2.4E+04	1.886	99% Chebyshev	96 of 166
Fluorene	0.0442	1.11	0.00945	2.5E+04	2.6E+04	0.107	97.5% Chebyshev	41 of 166
gamma-Chlordane	0.00069043	0.0156	0.00071	5.1E+01	---	0.0017	97.5% Chebyshev	12 of 166
Indeno(1,2,3-cd)pyrene	0.368	6.49	0.0574	2.4E+01	2.3E+00	0.761	97.5% Chebyshev	104 of 166
Iron	14277	77100	2410	---	1.0E+05	17453	95% Chebyshev	166 of 166
Isopropylbenzene (cumene)	0.831	64.9	0.000318	6.3E+03	5.8E+02	8.618	99% Chebyshev	16 of 83
Lead	53.52	702	2.48	1.6E+03	8.0E+02	104	97.5% Chebyshev	166 of 166
Lithium	10.03	28.6	0.65	1.90E+03	2.3E+04	12.17	95% Chebyshev	166 of 166
m,p-Xylene	0.0347	2.56	0.000558	6.50E+03	2.1E+02	0.227	97.5% Chebyshev	53 of 83
Manganese	261.2	892	59.3	2.4E+04	3.5E+04	277.5	95% Student's-t	166 of 166
Mercury	0.0262	0.85	0.0026	3.3E+00	3.4E+02	0.0718	97.5% Chebyshev	73 of 166
Methylcyclohexane	0.0369	2.73	0.000223	3.3E+04	1.4E+02	0.242	97.5% Chebyshev	57 of 83
Molybdenum	0.89	10.4	0.088	4.5E+03	5.7E+03	1.61	97.5% Chebyshev	118 of 166
Naphthalene	0.323	19.2	0.00482	1.9E+02	2.1E+02	2.775	99% Chebyshev	8 of 83
Nickel	11.74	36.7	2.7	7.9E+03	2.3E+04	12.37	95% Student's-t	166 of 166
n-Propylbenzene	0.0237	1.8	0.00023	4.1E+03	2.4E+02	0.159	97.5% Chebyshev	14 of 83
o-Xylene	0.0132	0.84	0.000223	8.00E+03	2.8E+02	0.077	97.5% Chebyshev	32 of 83
Phenanthrene	0.401	12.6	0.0136	1.9E+04	---	1.349	99% Chebyshev	95 of 166
Pyrene	0.432	8.47	0.0121	1.9E+04	3.2E+04	1.29	99% Chebyshev	98 of 166
Strontium	75.61	591	16.5	4.9E+05	1.0E+05	100.6	95% Chebyshev	166 of 166
Tin	0.616	6.48	0.52	4.0E+05	---	0.91	95% Chebyshev	40 of 166
Titanium	25.77	645	4.02	1.0E+06	---	32.21	95% Student's-t	166 of 166
Toluene	0.00574	0.0192	0.000721	2.90E+04	5.2E+02	0.0137	97.5% Chebyshev	69 of 83
Vanadium	14.4	45.6	4.73	2.3E+03	1.1E+03	15.17	95% Approx. Gamma	166 of 166
Xylene (total)	0.0479	3.4	0.000777	6.50E+03	2.1E+02	0.304	97.5% Chebyshev	53 of 83
Zinc	433.8	7650	6.17	2.5E+05	1.0E+05	815.2	97.5% Chebyshev	166 of 166

Notes:

* Soil was collected from 0 to 4 ft. below ground surface.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - Total Soil Comb. PCL = TCEQ Protective Concentration Level for 30 acre source area Commercial/Industrial total soil combined pathway (includes inhalation; ingestion; dermal pathways).

⁽²⁾ - From EPA's "Region 6 Human Health Medium-Specific Screening Levels 2004-2005". Industrial Outdoor Worker.

⁽³⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 3
EXPOSURE POINT CONCENTRATIONS (mg/L)
SOUTH AREA ZONE A GROUNDWATER

Chemical of Interest [*]	Average		RME EPC ⁽¹⁾	Notes:	# of Detects/# of Samples
1,1,1-Trichloroethane	1.85E-04		1.40E-03	RME EPC is max detect	1 of 13
1,1-Dichloroethane	2.10E-03		1.50E-02	RME EPC is max detect	3 of 13
2-Butanone	4.30E-04		3.00E-03	RME EPC is max detect	1 of 13
2-Methylnaphthalene	7.76E-04		8.80E-03	RME EPC is max detect	1 of 13
4,4'-DDE	3.34E-06		1.00E-05	RME EPC is max detect	1 of 13
Acetophenone	3.72E-03		4.60E-02	RME EPC is max detect	1 of 13
Acrylonitrile	1.00E-03		6.50E-03	RME EPC is max detect	1 of 13
Aluminum	7.13E-01		7.52E+00	RME EPC is max detect	7 of 13
Antimony	1.02E-02		4.30E-02	RME EPC is max detect	8 of 13
Arsenic	1.61E-02		5.70E-02	RME EPC is max detect	2 of 13
Barium	9.88E-02		2.20E-01	RME EPC is max detect	13 of 13
Benzene	4.25E-04		4.20E-03	RME EPC is max detect	1 of 13
Benzo(a)pyrene	1.06E-04		6.00E-04	RME EPC is max detect	1 of 13
Benzo(b)fluoranthene	3.26E-04		2.80E-03	RME EPC is max detect	1 of 13
Benzo(g,h,i)perylene	2.11E-04		1.60E-03	RME EPC is max detect	1 of 13
Benzoic Acid	8.40E-04		1.20E-03	RME EPC is max detect	8 of 13
Bis(2-ethylhexyl)Phthalate	1.46E-03		6.00E-04	RME EPC is max detect*	2 of 13
Boron	2.67E+00		4.04E+00	RME EPC is max detect	13 of 13
Carbazole	7.00E-04		8.40E-03	RME EPC is max detect	1 of 13
Carbon Disulfide	6.50E-05		3.00E-04	RME EPC is max detect	1 of 13
Chromium	5.53E-02		1.50E-01	RME EPC is max detect	13 of 13
Chrysene	1.93E-04		6.00E-04	RME EPC is max detect	1 of 13
cis-1,2-Dichloroethene	3.27E-03		3.00E-02	RME EPC is max detect	4 of 13
Cobalt	3.06E-03		8.90E-03	RME EPC is max detect	7 of 13
Cyclohexane	6.09E-04		6.80E-03	RME EPC is max detect	1 of 13
Dibenz(a,h)anthracene	2.90E-04		2.10E-03	RME EPC is max detect	1 of 13
Di-n-octyl Phthalate	2.08E-04		7.00E-04	RME EPC is max detect	1 of 13
Endosulfan II	5.61E-06		3.10E-05	RME EPC is max detect	1 of 14
Endosulfan Sulfate	8.57E-06		1.00E-04	RME EPC is max detect	1 of 14
Endrin Ketone	3.74E-06		2.30E-05	RME EPC is max detect	1 of 13
Fluorene	1.84E-04		1.00E-03	RME EPC is max detect	1 of 13
gamma-BHC (Lindane)	7.66E-06		4.20E-05	RME EPC is max detect	2 of 14
Heptachlor Epoxide	5.07E-06		2.01E-05	RME EPC is max detect	1 of 14
Indeno(1,2,3-cd)pyrene	2.92E-04		2.40E-03	RME EPC is max detect	1 of 13
Iron	6.39E+00		2.52E+01	RME EPC is max detect	13 of 13
Isopropylbenzene (Cumene)	1.78E-04		1.60E-03	RME EPC is max detect	1 of 13
Lithium	3.61E-01		6.60E-01	RME EPC is max detect	13 of 13
m,p-Cresol	1.10E-03		8.20E-03	RME EPC is max detect	1 of 13
Manganese	4.15E+00		1.28E+01	RME EPC is max detect	13 of 13
Molybdenum	2.30E-03		2.00E-03	RME EPC is max detect	1 of 13
MTBE	3.90E-03		3.20E-02	RME EPC is max detect	3 of 13
Nickel	7.40E-03		2.20E-02	RME EPC is max detect	10 of 14
o-Cresol	4.47E-04		4.40E-03	RME EPC is max detect	1 of 13
Phenanthrene	2.12E-04		1.60E-03	RME EPC is max detect	1 of 13
Selenium	9.08E-03		3.80E-02	RME EPC is max detect	2 of 13
Silver	7.38E-03		9.46E+00	RME EPC is max detect	12 of 13
Strontium	9.03E+00		1.71E+01	RME EPC is max detect	13 of 13
Thallium	2.00E-03		7.30E-03	RME EPC is max detect	1 of 13
Titanium	5.30E-03		3.10E-02	RME EPC is max detect	7 of 13
Vanadium	8.56E-03		2.30E-02	RME EPC is max detect	7 of 13
Vinyl Chloride	1.85E-04		1.90E-03	RME EPC is max detect	1 of 13

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected and because J flagged data (estimated) were used in the risk assessment.

* Chemicals of interest are any chemical measured in at least one sample.

⁽¹⁾ RME EPC is the reasonable maximum exposure exposure point concentration.

TABLE 4
EXPOSURE POINT CONCENTRATIONS (mg/L)
INTRACOASTAL WATERWAY SURFACE WATER (TOTAL)

Chemical of Interest [*]	Average	Max Detection	Min Detection	TotRW _{Comb} ⁽¹⁾	RME EPC ⁽²⁾	Statistic Used	# of Detects/# of Samples
Acrylonitrile	9.38E-04	2.10E-03	2.10E-03	7.57E-02	2.10E-03	RME EPC is max detect	1 of 4
Aluminum	4.05E-01	5.50E-01	2.80E-01	4.03E+02	5.50E-01	RME EPC is max detect	4 of 4
Barium	2.40E-02	2.60E-02	2.20E-02	6.49E+01	2.60E-02	RME EPC is max detect	4 of 4
Boron	4.69E+00	4.81E+00	4.60E+00	7.44E+01	4.81E+00	RME EPC is max detect	4 of 4
Chromium	7.98E-02	1.20E-01	7.00E-02	1.26E+02	1.20E-01	RME EPC is max detect	4 of 4
Copper	6.53E-03	1.10E-02	9.10E-03	3.31E+01	1.10E-02	RME EPC is max detect	2 of 4
Iron	4.63E-01	5.90E-01	3.20E-01	—	5.90E-01	RME EPC is max detect	4 of 4
Lithium	2.53E-01	2.70E-01	2.20E-01	1.65E+01	2.70E-01	RME EPC is max detect	4 of 4
Manganese	4.03E-02	4.80E-02	3.30E-02	4.09E+01	4.80E-02	RME EPC is max detect	4 of 4
Silver	2.80E-03	3.70E-03	2.80E-03	1.57E+00	3.70E-03	RME EPC is max detect	3 of 4
Strontium	7.22E+00	7.35E+00	6.95E+00	3.38E+02	7.35E+00	RME EPC is max detect	4 of 4
Titanium	3.90E-03	5.70E-03	2.00E-03	8.67E+04	5.70E-03	RME EPC is max detect	4 of 4
Vanadium	4.25E-02	6.10E-02	3.50E-02	1.08E+00	6.10E-02	RME EPC is max detect	4 of 4

Notes:

* Chemicals of interest are any chemical measured in at least one sample.

⁽¹⁾ - From Tier 1 Contact Recreation Water PCLs. TCEQ, March 31, 2006.

⁽²⁾ RME EPC is the reasonable maximum exposure point concentration.

TABLE 5
EXPOSURE POINT CONCENTRATIONS (mg/L)
INTRACOASTAL WATERWAY BACKGROUND SURFACE WATER (TOTAL)

Chemical of Interest ⁺	Average	Max Detection	Min Detection	Total RW _{Comb} ⁽¹⁾	RME EPC ⁽²⁾	Statistic Used	# of Detects/# of Samples
4,4'-DDD	3.30E-06	7.62E-06	3.60E-06	---	7.62E-06	RME EPC is max detect	2 of 4
4,4'-DDT	4.93E-06	1.30E-05	1.30E-05	---	1.30E-05	RME EPC is max detect	1 of 4
Acetone	1.47E-03	4.52E-03	4.52E-03	7.80E+02	4.52E-03	RME EPC is max detect	1 of 4
Aldrin	9.24E-06	1.10E-05	4.40E-06	---	1.10E-05	RME EPC is max detect	4 of 4
Aluminum	2.44E-01	4.00E-01	2.10E-01	4.03E+02	4.00E-01	RME EPC is max detect	4 of 4
Barium	1.96E-02	2.00E-02	2.00E-02	6.49E+01	2.00E-02	RME EPC is max detect	4 of 4
Benzo(g,h,i)perylene	1.20E-04	2.02E-04	2.02E-04	---	2.02E-04	RME EPC is max detect	1 of 4
Benzo(k)fluoranthene	1.73E-04	3.11E-04	3.11E-04	---	3.11E-04	RME EPC is max detect	1 of 4
Bis(ethylhexyl) Phthalate	4.17E-03	1.97E-02	1.94E-02	---	1.97E-02	RME EPC is max detect	2 of 4
Boron	4.38E+00	4.50E+00	4.27E+00	7.44E+01	4.50E+00	RME EPC is max detect	4 of 4
Chromium	7.84E-02	7.90E-02	7.80E-02	1.26E+02	7.90E-02	RME EPC is max detect	4 of 4
Chromium VI	6.20E-03	1.10E-02	1.10E-02	2.43E-01	1.10E-02	RME EPC is max detect	1 of 4
Chrysene	1.61E-04	3.68E-04	3.68E-04	---	3.68E-04	RME EPC is max detect	1 of 4
Di-n-butyl Phthalate	6.70E-04	1.42E-03	8.28E-04	4.49E+00	1.42E-03	RME EPC is max detect	2 of 4
Di-n-octyl Phthalate	2.65E-04	6.50E-04	6.50E-04	---	6.50E-04	RME EPC is max detect	1 of 4
Iron	3.40E-01	4.30E-01	3.40E-01	---	4.30E-01	RME EPC is max detect	4 of 4
Lithium	3.00E-01	3.40E-01	2.70E-01	1.65E+01	3.40E-01	RME EPC is max detect	4 of 4
Manganese	3.60E-02	4.10E-02	3.40E-02	4.09E+01	4.10E-02	RME EPC is max detect	4 of 4
Methoxychlor	3.66E-06	1.40E-05	1.40E-05	7.19E-02	1.40E-05	RME EPC is max detect	1 of 4
Molybdenum	2.72E-03	4.20E-03	1.80E-03	3.47E+00	4.20E-03	RME EPC is max detect	2 of 4
Silver	5.43E-03	5.90E-03	4.70E-03	1.57E+00	5.90E-03	RME EPC is max detect	4 of 4
Strontium	7.76E+00	8.31E+00	7.31E+00	3.38E+02	8.31E+00	RME EPC is max detect	4 of 4
Titanium	2.98E-03	4.20E-03	2.40E-03	8.67E+04	4.20E-03	RME EPC is max detect	4 of 4
Vanadium	4.14E-02	3.70E-02	1.10E-02	1.08E+00	3.70E-02	RME EPC is max detect	4 of 4

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

⁽¹⁾ - From Tier 1 Contact Recreation Water PCLs. TCEQ, March 31, 2006.

⁽²⁾ RME EPC is the reasonable maximum exposure point concentration.

TABLE 6
EXPOSURE POINT CONCENTRATIONS (mg/kg)
INTRACOASTAL WATERWAY SEDIMENT

Chemical of Interest*	Average	Max Detection	Min Detection	Tot Sed _{comb} ⁽¹⁾	95% UCL	Statistic Used ⁽²⁾	# of Detects/# of Samples
1,2-Dichloroethane	4.10E-04	3.02E-03	3.02E-03	6.0E+02	1.10E-03	95% Chebyshev	1 of 16
1,2-Diphenylhydrazine/azobenzene	7.30E-03	3.17E-02	3.17E-02	1.3E+02	1.03E-02	95% Student's-t	1 of 16
2-Methylnaphthalene	8.30E-03	1.88E-02	1.88E-02	4.9E+02	9.60E-03	95% Student's-t	1 of 16
3,3'-Dichlorobenzidine	4.08E-02	1.51E-01	1.51E-01	3.2E+01	5.38E-02	95% Student's-t	1 of 16
4,4'-DDT	4.11E-04	3.32E-03	4.81E-04	8.7E+01	2.30E-03	99% Chebyshev	4 of 17
4,6-Dinitro-2-methylphenol	1.70E-02	6.27E-02	6.27E-02	3.1E+02	2.24E-02	95% Student's-t	1 of 16
Acenaphthylene	1.16E-02	6.31E-02	2.39E-02	7.4E+03	2.73E-02	95% Chebyshev	2 of 16
Aluminum	6.85E+03	1.25E+04	3.90E+03	1.5E+05	7.88E+03	95% Student's-t	16 of 16
Anthracene	2.01E-02	7.53E-02	2.36E-02	3.7E+04	4.24E-02	95% Chebyshev	6 of 16
Antimony	2.25E+00	8.14E+00	7.40E-01	8.3E+01	2.99E+00	95% Approx. Gamma	16 of 16
Arsenic	4.03E+00	7.62E+00	2.41E+00	1.1E+02	4.64E+00	95% Student's-t	16 of 16
Atrazine (Aatrex)	1.79E-02	8.14E-02	8.14E-02	6.4E+01	2.54E-02	95% Student's-t	1 of 16
Barium	2.15E+02	3.77E+02	1.16E+02	2.3E+04	2.43E+02	95% Approx. Gamma	16 of 16
Benzo(a)anthracene	4.54E-02	3.95E-01	6.75E-02	1.6E+01	3.01E-01	99% Chebyshev	3 of 16
Benzo(a)pyrene	6.61E-02	4.45E-01	5.25E-02	1.6E+00	3.52E-01	99% Chebyshev	6 of 16
Benzo(b)fluoranthene	1.00E-01	6.11E-01	3.24E-02	1.6E+01	4.91E-01	99% Chebyshev	9 of 16
Benzo(g,h,i)perylene	6.61E-02	4.42E-01	1.73E-02	3.7E+03	3.57E-01	99% Chebyshev	7 of 16
Benzo(k)fluoranthene	5.89E-02	3.18E-01	4.74E-02	1.6E+02	2.71E-01	99% Chebyshev	6 of 16
Beryllium	4.63E-01	8.20E-01	2.90E-01	2.7E+01	5.28E-01	95% Student's-t	16 of 16
Boron	1.20E+01	2.72E+01	1.25E+01	1.1E+05	2.72E+01	Maximum*	10 of 16
Butyl Benzyl Phthalate	2.08E-02	2.02E-01	2.02E-01	3.1E+04	7.35E-02	95% Chebyshev	1 of 16
Carbazole	1.51E-02	8.61E-02	1.95E-02	7.1E+02	3.84E-02	95% Chebyshev	3 of 16
Chloroform	9.02E-04	5.27E-03	5.04E-03	7.3E+03	5.00E-03	99% Chebyshev	2 of 16
Chromium	9.21E+00	1.44E+01	5.01E+00	3.6E+04	1.04E+01	95% Student's-t	16 of 16
Chrysene	7.74E-02	4.75E-01	1.37E-02	1.6E+03	1.53E-01	95% Approx. Gamma	10 of 16
Cobalt	4.39E+00	7.16E+00	3.05E+00	3.2E+04	4.88E+00	95% Student's-t	16 of 16
Copper	7.11E+00	1.26E+01	3.28E+00	2.1E+04	8.43E+00	95% Student's-t	16 of 16
Cyclohexane	2.30E-03	1.92E-03	1.92E-03	1.0E+06	2.90E-03	95% Approx. Gamma	1 of 16
Dibenz(a,h)anthracene	4.35E-02	2.35E-01	5.11E-02	1.6E+00	2.05E-01	99% Chebyshev	6 of 16
Dibenzofuran	1.23E-02	3.05E-02	2.68E-02	6.1E+02	1.52E-02	95% Student's-t	2 of 16
Diethyl Phthalate	1.35E-02	3.89E-02	3.89E-02	1.2E+05	1.66E-02	95% Student's-t	1 of 16
Di-n-octyl Phthalate	1.80E-02	1.92E-01	1.47E-02	3.1E+03	6.86E-02	95% Chebyshev	2 of 16
Fluoranthene	1.13E-01	8.04E-01	2.22E-02	4.9E+03	6.14E-01	99% Chebyshev	8 of 16
Fluorene	1.22E-02	4.60E-02	1.24E-02	4.9E+03	2.43E-02	95% Chebyshev	4 of 16
Gamma-Chlordane	3.13E-04	8.26E-04	6.38E-04	4.1E+01	5.70E-04	95% Chebyshev	4 of 16
Hexachlorobenzene	1.00E-02	3.19E-02	3.19E-02	8.9E+00	1.26E-02	95% Student's-t	1 of 16
Indeno(1,2,3-cd)pyrene	7.22E-02	4.05E-01	5.56E-02	1.6E+01	3.47E-01	99% Chebyshev	6 of 16
Iron	1.34E+04	2.82E+04	6.75E+03	---	1.60E+04	95% Approx. Gamma	16 of 16
Lead	1.16E+01	3.23E+01	5.00E+00	5.0E+02	1.48E+01	95% Approx. Gamma	16 of 16
Isopropylbenzene (cumene)	1.00E-03	7.04E-03	4.64E-03	7.3E+04	5.80E-03	99% Chebyshev	2 of 16
Lithium	1.05E+01	2.00E+01	6.40E+00	1.1E+04	1.21E+01	95% Student's-t	16 of 16
Manganese	2.83E+02	4.74E+02	1.92E+02	1.4E+04	3.22E+02	95% Student's-t	16 of 16
Mercury	2.01E-02	3.60E-02	1.10E-02	3.4E+01	2.33E-02	95% Student's-t	16 of 16
Methylcyclohexane	9.51E-04	3.70E-03	3.70E-03	1.0E+06	1.30E-03	95% Approx. Gamma	1 of 16
Molybdenum	6.67E-01	5.66E+00	1.40E-01	1.8E+03	2.15E+00	95% Chebyshev	16 of 16
Nickel	9.59E+00	1.67E+01	5.80E+00	1.4E+03	1.08E+01	95% Student's-t	16 of 16
n-Nitrosodiphenylamine	1.02E-02	4.34E-02	4.34E-02	9.0E+02	1.41E-02	95% Student's-t	1 of 16
Phenanthrene	7.46E-02	5.08E-01	3.11E-02	3.7E+03	3.88E-01	99% Chebyshev	8 of 16
Pyrene	1.30E-01	8.62E-01	1.76E-02	3.7E+03	6.78E-01	99% Chebyshev	10 of 16
Silver	1.72E-01	5.40E-01	3.00E-01	3.5E+02	3.76E-01	Maximum*	6 of 16
Strontium	4.49E+01	8.17E+01	3.28E+01	1.5E+05	5.12E+01	95% Student's-t	16 of 16
Titanium	2.56E+01	3.66E+01	1.91E+01	1.0E+06	2.78E+01	95% Student's-t	16 of 16
Toluene	1.40E-03	5.81E-03	5.81E-03	5.9E+04	2.00E-03	95% Approx. Gamma	1 of 16
Vanadium	1.39E+01	2.12E+01	9.06E+00	3.3E+02	1.54E+01	95% Student's-t	16 of 16
Zinc	4.54E+01	9.26E+01	1.80E+01	7.6E+04	5.41E+01	95% Student's-t	16 of 16

Notes:

* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - From Tier 1 Sediment PCLs. TCEQ, March 31, 2006.

⁽²⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 7
EXPOSURE POINT CONCENTRATION (mg/kg)
INTRACOASTAL WATERWAY BACKGROUND SEDIMENT

Chemical of Interest ⁺	Average	Max Detection	Min Detection	TotSed _{Comb} ⁽¹⁾	95% UCL	Statistic Used ⁽²⁾	# of Detects/# of Samples
1,2,4-Trimethylbenzene	9.10E-04	3.91E-03	3.91E-03	3.7E+04	2.00E-03	95% Approx. Gamma	1 of 9
1,4-Dichlorobenzene	1.40E-03	4.11E-03	4.11E-03	2.3E+03	2.80E-03	95% Approx. Gamma	1 of 9
2-Butanone	1.10E-03	2.16E-03	2.00E-03	4.4E+05	1.70E-03	95% Student's-t	2 of 9
4,4'-DDT	1.56E-04	5.70E-04	5.70E-04	8.7E+01	3.82E-04	95% Chebyshev	1 of 9
Aluminum	1.22E+04	2.18E+04	4.73E+03	1.5E+05	1.65E+04	95% Student's-t	9 of 9
Antimony	4.02E+00	7.33E+00	1.68E+00	8.3E+01	5.40E+00	95% Student's-t	9 of 9
Arsenic	5.81E+00	9.62E+00	2.36E+00	1.1E+02	7.74E+00	95% Student's-t	9 of 9
Barium	209.7.2	2.80E+02	1.11E+02	2.3E+04	2.39E+02	95% Student's-t	9 of 9
Benzo(b)fluoranthene	8.70E-03	3.69E-02	3.69E-02	1.8E+01	2.41E-02	95% Chebyshev	1 of 9
Beryllium	7.66E-01	1.32E+00	3.20E-01	2.7E+01	1.02E+00	95% Student's-t	9 of 9
Boron	2.76E+01	4.79E+01	1.33E+01	1.1E+05	3.56E+01	95% Student's-t	9 of 9
Carbon Disulfide	1.50E-03	8.41E-03	3.41E-03	7.3E+04	4.80E-03	95% Approx. Gamma	2 of 9
Chromium	1.28E+01	2.25E+01	5.81E+00	3.6E+04	1.69E+01	95% Student's-t	9 of 9
cis-1,2-Dichloroethene	3.40E-03	2.84E-02	2.84E-02	7.3E+03	3.45E-02	99% Chebyshev	1 of 9
Cobalt	6.70E+00	1.18E+01	3.32E+00	3.2E+04	8.68E+00	95% Student's-t	9 of 9
Copper	8.14E+00	1.68E+01	2.68E+00	2.1E+04	1.13E+01	95% Student's-t	9 of 9
Iron	1.65E+04	2.79E+04	7.44E+03	---	2.15E+04	95% Student's-t	9 of 9
Lead	9.59E+00	1.45E+01	5.34E+00	5.0E+02	1.18E+01	95% Student's-t	9 of 9
Lithium	2.14E+01	4.46E+01	7.29E+00	1.1E+04	3.03E+01	95% Student's-t	9 of 9
Manganese	3.31E+02	4.42E+02	2.12E+02	1.4E+04	3.86E+02	95% Student's-t	9 of 9
Mercury	1.76E-02	5.00E-02	6.50E-03	3.4E+01	2.73E-02	95% Approx. Gamma	9 of 9
Molybdenum	2.41E-01	3.50E-01	1.60E-01	1.8E+03	2.83E-01	95% Student's-t	9 of 9
Nickel	1.49E+01	2.73E+01	6.31E+00	1.4E+03	1.99E+01	95% Student's-t	9 of 9
Strontium	5.92E+01	8.74E+01	3.48E+01	1.5E+05	7.28E+01	95% Student's-t	9 of 9
Titanium	3.18E+01	5.45E+01	2.11E+01	1.0E+06	3.83E+01	95% Student's-t	9 of 9
Trichloroethene	2.10E-03	1.59E-02	1.59E-02	4.4E+03	4.30E-03	99% Chebyshev	1 of 9
Vanadium	2.02E+01	3.42E+01	1.02E+01	3.3E+02	2.59E+01	95% Student's-t	9 of 9
Xylene	1.70E-03	3.35E-03	3.35E-03	1.5E+05	2.60E-03	95% Student's-t	1 of 9
Zinc	3.60E+01	5.41E+01	1.93E+01	7.6E+04	4.45E+01	95% Student's-t	9 of 9

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - From Tier 1 Sediment PCLs. TCEQ, March 31, 2006.

⁽²⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 8
EXPOSURE POINT CONCENTRATIONS (mg/kg)
NORTH AREA SURFACE SOIL*

Chemical of Interest*	Average	Max Detection	Min Detection	TotSoil _{comb} ⁽¹⁾	EPA Region 6 Soil Screening Criteria ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
2-Methylnaphthalene	0.0123	0.053	0.01	2.5E+03	---	0.0275	95% Chebyshev	3 of 18
4,4'-DDE	0.0011	0.0149	0.00216	7.3E+01	7.8E+00	0.0093	99% Chebyshev	2 of 18
4,4'-DDT	0.0012	0.0108	0.000597	6.8E+01	7.8E+00	0.0073	99% Chebyshev	7 of 18
Acenaphthene	0.0161	0.157	0.021	3.7E+04	3.3E+04	0.0528	95% Chebyshev	2 of 18
Acenaphthylene	0.0099	0.0555	0.0555	3.7E+04	---	0.0234	95% Chebyshev	1 of 18
Aluminum	10673	16800	1810	5.7E+05	1.0E+05	12185	95% Student's-t	18 of 18
Anthracene	0.0257	0.264	0.00887	1.9E+05	1.0E+05	0.168	99% Chebyshev	4 of 18
Antimony	1.744	8.09	1.66	3.1E+02	4.5E+02	6.777	99% Chebyshev	9 of 18
Aroclor-1254	0.0037	0.0122	0.0122	---	8.3E-01	0.0077	95% Chebyshev	1 of 18
Arsenic	2.522	5.69	0.54	2.0E+02	1.8E+00	2.999	95% Student's-t	17 of 18
Barium	145.2	476	46.1	8.9E+04	7.9E+04	264.2	95% Chebyshev	18 of 18
Benzo(a)anthracene	0.0715	1.18	1.18	2.4E+01	2.3E+00	0.72	99% Chebyshev	1 of 18
Benzo(a)pyrene	0.114	1.42	0.0135	2.4E+00	2.3E-01	0.888	99% Chebyshev	7 of 18
Benzo(b)fluoranthene	0.146	1.62	0.0487	2.4E+01	2.3E+00	0.352	95% Adjusted Gamma	8 of 18
Benzo(g,h,i)perylene	0.132	1.28	0.0237	1.9E+04	---	0.842	99% Chebyshev	10 of 18
Benzo(k)fluoranthene	0.0689	0.799	0.011	2.4E+02	2.3E+01	0.505	99% Chebyshev	4 of 18
Beryllium	0.708	2.88	0.066	2.5E+02	2.2E+03	2.125	99% Chebyshev	17 of 18
Bis(2-ethylhexyl)phthalate	0.0462	0.239	0.0122	5.6E+02	1.4E+02	0.0978	95% Chebyshev	6 of 18
Boron	8.028	39.2	3.15	1.9E+05	1.0E+05	13.49	95% Approx. Gamma	13 of 18
Butyl Benzyl Phthalate	0.016	0.151	0.151	1.0E+04	2.4E+02	0.0514	95% Chebyshev	1 of 18
Cadmium	0.207	0.8	0.28	8.5E+02	5.6E+02	0.799	99% Chebyshev	8 of 18
Carbazole	0.0153	0.128	0.013	9.5E+02	9.6E+01	0.045	95% Chebyshev	4 of 18
Chromium	20.26	128	7.9	5.7E+04	5.0E+02	48.59	95% Student's-t	18 of 18
Chrysene	0.102	1.3	0.011	2.4E+03	2.3E+02	0.812	99% Chebyshev	7 of 18
Cobalt	5.789	7.87	2.81	2.7E+02	2.1E+03	6.406	95% Student's-t	18 of 18
Copper	24.13	200	5.9	3.7E+04	4.2E+04	70.01	95% Chebyshev	18 of 18
Dibenz(a,h)anthracene	0.0471	0.404	0.045	2.4E+00	2.3E-01	0.284	99% Chebyshev	4 of 18
Dibenzofuran	0.0129	0.0862	0.0862	2.7E+03	1.7E+03	0.0336	95% Chebyshev	1 of 18
Dieldrin	0.0004866	0.00545	0.00545	1.1E+00	1.2E-01	0.0034	99% Chebyshev	1 of 18
Diethyl Phthalate	0.0113	0.011	0.011	2.0E+03	1.0E+05	0.0215	95% Chebyshev	1 of 18
Di-n-butyl Phthalate	0.0179	0.01	0.01	1.6E+04	6.8E+04	0.0357	95% Chebyshev	1 of 18
Di-n-octyl Phthalate	0.0144	0.123	0.0154	1.3E+04	2.7E+04	0.0428	95% Chebyshev	2 of 18
Endrin	0.000304	0.00149	0.00149	1.3E+02	2.1E+02	0.000759	95% Chebyshev	1 of 18
Endrin Ketone	0.000874	0.00966	0.00966	1.8E+02	---	0.0031	95% Chebyshev	1 of 18
Fluoranthene	0.159	2.19	0.0214	2.5E+04	2.4E+04	1.358	99% Chebyshev	6 of 18
Fluorene	0.0163	0.141	0.017	2.6E+04	2.6E+04	0.0496	95% Chebyshev	3 of 18
Indeno(1,2,3-cd)pyrene	0.151	1.51	0.02	2.4E+01	2.3E+00	0.969	99% Chebyshev	9 of 18
Iron	19477	102000	8450	---	1.0E+05	41127	95% Chebyshev	18 of 18
Lead	57.7	471	8.22	1.6E+03	8.0E+02	318.3	99% Chebyshev	18 of 18
Lithium	16.57	26.6	2.59	1.9E+03	2.3E+04	18.68	95% Student's-t	18 of 18
Manganese	369.5	1210	82.3	2.4E+04	3.5E+04	473.3	95% Approx. Gamma	18 of 18
Mercury	0.0126	0.064	0.006	3.3E+00	3.4E+02	0.0218	95% Approx. Gamma	8 of 18
Molybdenum	0.949	10.7	0.085	4.5E+03	5.7E+03	6.812	99% Chebyshev	11 of 18
Nickel	17.04	51.7	11.7	7.9E+03	2.3E+04	20.76	95% Student's-t	18 of 18
Phenanthrene	0.109	1.34	0.018	1.9E+04	---	0.845	99% Chebyshev	7 of 18
Pyrene	0.147	1.87	0.0149	1.9E+04	3.2E+04	1.169	99% Chebyshev	8 of 18
Silver	0.0543	0.41	0.092	1.7E+03	5.7E+03	0.148	95% Chebyshev	2 of 18
Strontium	57.32	93.6	26.6	4.9E+05	1.0E+05	65.4	95% Student's-t	18 of 18
Thallium	0.109	0.63	0.63	7.8E+01	---	0.273	95% Chebyshev	1 of 18
Tin	0.625	3.67	0.68	4.0E+05	---	1.494	95% Chebyshev	4 of 18
Titanium	20.67	55.9	3.41	1.0E+06	---	26.26	95% Approx. Gamma	18 of 18
Vanadium	19.66	45.8	7.85	2.3E+03	1.1E+03	23.4	95% Student's-t	18 of 18
Zinc	418.4	5640	29.5	2.5E+05	1.0E+05	3485	99% Chebyshev	18 of 18

Notes:

* Surface soil was collected from 0 to 0.5 ft. below ground surface.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - TotSoil_{comb} PCL = TCEQ Protective Concentration Level for 30 acre source area Commercial/Industrial total soil combined pathway (includes inhalation; ingestion; dermal pathways).

⁽²⁾ - From EPA's "Region 6 Human Health Medium-Specific Screening Levels 2004-2005". Industrial Outdoor Worker.

⁽³⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 9
EXPOSURE POINT CONCENTRATIONS (mg/kg)
NORTH AREA SOIL+

Chemical of Interest**	Average	Max Detection	Min Detection	Tot ¹ Soil _{Comb}	EPA Region 6 Soil Screening Criteria ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
1,1-Dichloroethane	0.0286	0.518	0.00161	4.3E+03	2.3E+03	0.299	99% Chebyshev	3 of 19
1,1-Dichloroethene	0.0179	0.313	0.00178	3.5E+03	4.7E+02	0.181	99% Chebyshev	2 of 19
1,2-Dichloroethane	0.0106	0.177	0.00231	1.1E+01	8.4E-01	0.103	99% Chebyshev	4 of 19
2-Butanone	0.0029	0.208	0.0017	7.3E+04	3.4E+04	0.121	99% Chebyshev	11 of 19
2-Methylnaphthalene	0.0103	0.053	0.01	2.5E+03	---	0.0198	95% Chebyshev	4 of 36
4,4'-DDE	0.0007	0.0149	0.00216	7.3E+01	7.8E+00	0.0024	95% Chebyshev	2 of 36
4,4'-DDT	0.000704	0.0108	0.000597	6.8E+01	7.8E+00	0.0038	99% Chebyshev	7 of 36
Acenaphthene	0.0142	0.157	0.021	3.7E+04	3.3E+04	0.036	95% Chebyshev	4 of 36
Aluminum	11971	18300	1810	5.7E+05	1.0E+05	13092	95% Student's-t	36 of 36
Anthracene	0.0215	0.264	0.00887	1.9E+05	1.0E+05	0.107	99% Chebyshev	6 of 36
Antimony	1.416	8.09	1.66	3.1E+02	4.5E+02	4.366	99% Chebyshev	16 of 36
Aroclor-1254	0.0056	0.0938	0.0122	---	8.3E-01	0.0168	95% Chebyshev	2 of 36
Arsenic	2.573	5.69	0.54	2.0E+02	1.8E+00	2.959	95% Student's-t	32 of 36
Barium	142.1	362	46.1	8.9E+04	7.9E+04	211.7	95% Student's-t	36 of 36
Benzene	0.0027	0.00632	0.00138	1.1E+02	1.6E+00	0.0034	95% Student's-t	12 of 19
Benzo(a)anthracene	0.068	1.18	0.0383	2.4E+01	2.3E+00	0.464	99% Chebyshev	4 of 36
Benzo(a)pyrene	0.0922	1.42	0.0135	2.4E+00	2.3E-01	0.554	99% Chebyshev	10 of 36
Benzo(b)fluoranthene	0.12	1.62	0.0487	2.4E+01	2.3E+00	0.649	99% Chebyshev	11 of 36
Benzo(g,h,i)perylene	0.0961	1.28	0.0237	1.9E+04	---	0.494	99% Chebyshev	14 of 36
Benzo(k)fluoranthene	0.0601	0.799	0.068	2.4E+02	2.3E+01	0.341	99% Chebyshev	6 of 36
Beryllium	0.752	2.88	0.066	2.5E+02	2.2E+03	1.087	95% Chebyshev	35 of 36
Bis(2-ethylhexyl)phthalate	0.0428	0.239	0.0122	5.6E+02	1.4E+02	0.0753	95% Chebyshev	11 of 36
Boron	7.576	39.2	3.14	1.9E+05	1.0E+05	20.55	99% Chebyshev	26 of 36
Bromoform	0.0023	0.018	0.011	6.0E+02	2.4E+02	0.013	99% Chebyshev	2 of 19
Butyl Benzyl Phthalate	0.0125	0.151	0.054	1.0E+04	2.4E+02	0.031	95% Chebyshev	2 of 36
Cadmium	0.193	0.8	0.28	8.5E+02	5.6E+02	0.59	99% Chebyshev	15 of 36
Carbazole	0.0143	0.128	0.0108	9.5E+02	9.6E+01	0.0323	95% Chebyshev	7 of 36
Carbon Disulfide	0.0028	0.0284	0.00757	7.2E+03	7.2E+02	0.018	99% Chebyshev	3 of 19
Chromium	17.17	128	7.76	5.7E+04	5.0E+02	22.69	95% Student's-t	36 of 36
Chrysene	0.0885	1.3	0.0104	2.4E+03	2.3E+02	0.529	99% Chebyshev	11 of 36
cis-1,2-Dichloroethene	0.0541	0.999	0.0195	4.7E+03	1.6E+02	0.577	99% Chebyshev	2 of 19
Cobalt	6.318	10.3	2.81	2.7E+02	2.1E+03	6.808	95% Student's-t	36 of 36
Copper	18.7	200	4.59	3.7E+04	4.2E+04	41.87	95% Student's-t	36 of 36
Cyclohexane	0.0056	0.00185	0.000981	4.2E+04	6.8E+03	0.00185	Maximum*	5 of 19
Dibenz(a,h)anthracene	0.0384	0.404	0.045	2.4E+00	2.3E-01	0.177	99% Chebyshev	7 of 36
Dibenzofuran	0.0099	0.0862	0.015	2.7E+03	1.7E+04	0.0205	95% Chebyshev	2 of 36
Diethyl Phthalate	0.0097	0.011	0.00992	2.0E+03	1.0E+05	0.0118	95% Student's-t	2 of 36
Di-n-butyl Phthalate	0.0155	0.015	0.01	1.6E+04	6.8E+04	0.0248	95% Chebyshev	2 of 36
Di-n-octyl Phthalate	0.0115	0.123	0.0154	1.3E+04	2.7E+04	0.0264	95% Chebyshev	3 of 36
Ethylbenzene	0.0016	0.00502	0.00114	1.0E+04	2.3E+02	0.00502	Maximum*	5 of 19
Fluoranthene	0.146	2.19	0.0214	2.5E+04	2.4E+04	0.923	99% Chebyshev	9 of 36
Fluorene	0.0112	0.141	0.017	2.5E+04	2.6E+04	0.0282	95% Chebyshev	4 of 36
Indeno(1,2,3-cd)pyrene	0.133	1.51	0.02	2.4E+01	2.3E+00	0.577	99% Chebyshev	13 of 36
Iron	17531	102000	7120	---	1.0E+05	21765	95% Student's-t	36 of 36
Methylcyclohexane	0.0024	0.00278	0.0015	3.3E+04	1.4E+02	0.00278	Maximum*	6 of 19
Molybdenum	0.586	10.7	0.085	4.5E+03	5.7E+03	3.551	99% Chebyshev	21 of 36
Naphthalene	0.0236	0.148	0.0013	1.9E+02	2.1E+02	0.102	99% Chebyshev	6 of 19
Nickel	17.17	51.7	9.74	7.9E+03	2.3E+04	18.79	95% Student's-t	36 of 36
Silver	0.0473	0.41	0.092	1.7E+03	5.7E+03	0.103	95% Student's-t	3 of 36
Strontium	56.15	96.2	22.1	4.9E+05	1.0E+05	62.05	95% Student's-t	36 of 36
Tetrachloroethene	0.0127	0.223	0.00135	3.3E+02	1.7E+00	0.129	99% Chebyshev	3 of 19
Tin	0.47	3.67	0.68	4.0E+05	---	0.926	95% Chebyshev	5 of 36
Titanium	20.83	57	3.41	1.0E+06	---	24.83	95% Student's-t	36 of 36
Toluene	0.0046	0.0122	0.00134	2.9E+04	5.2E+02	0.0122	Maximum*	8 of 19
Vanadium	20.54	45.8	7.85	2.3E+03	1.1E+03	22.9	95% Student's-t	36 of 36
Xylene (total)	0.119	1.76	0.00139	6.5E+03	2.1E+02	0.372	95% Adjusted Gamma	8 of 19
Zinc	242.5	5640	21.1	2.5E+05	1.0E+05	1784	99% Chebyshev	36 of 36

Notes:

* Recommended UCL exceeds maximum observation, so the maximum measured concentration was used as the EPC.

+ Soil was collected from 0 to 4 ft. below ground surface.

** Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - Tot¹Soil_{Comb} PCL = TCEQ Protective Concentration Level for 30 acre source area Commercial/Industrial total soil combined pathway (includes inhalation; ingestion; dermal pathways).

⁽²⁾ - From EPA's "Region 6 Human Health Medium-Specific Screening Levels 2004-2005". Industrial Outdoor Worker.

⁽³⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 10
EXPOSURE POINT CONCENTRATIONS (mg/L)
NORTH AREA ZONE A GROUNDWATER

Chemical of Interest*	Average	RME EPC ⁽¹⁾	Notes:	# of Detects/# of Samples
1,1,1-Trichloroethane	1.48E+01	1.56E+02	RME EPC is max detect	5 of 16
1,1-Dichloroethane	2.80E+00	3.15E+01	RME EPC is max detect	5 of 12
1,1-Dichloroethene	3.46E+00	2.92E+01	RME EPC is max detect	6 of 16
1,2,3-Trichloropropane	6.17E+00	4.43E+01	RME EPC is max detect	5 of 16
1,2,4-Trimethylbenzene	3.80E-02	4.20E-02	RME EPC is max detect	1 of 12
1,2-Dichloroethane	2.42E+01	3.28E+02	RME EPC is max detect	6 of 16
1,2-Dichloropropane	4.90E-01	3.45E+00	RME EPC is max detect	4 of 16
2-Methylnaphthalene	2.70E-03	1.60E-02	RME EPC is max detect	2 of 12
4,4'-DDD	2.48E-06	1.90E-05	RME EPC is max detect	1 of 12
4,4'-DDE	2.14E-05	2.70E-04	RME EPC is max detect	2 of 12
4-Chloroaniline	1.50E-03	1.30E-02	RME EPC is max detect	1 of 12
4-Isopropyltoluene	2.30E-02	2.00E-03	RME EPC is max detect*	1 of 12
Acenaphthene	9.00E-04	8.60E-03	RME EPC is max detect	1 of 12
Acetone	2.81E-01	1.15E-01	RME EPC is max detect*	1 of 12
Acetophenone	6.80E-03	7.40E-02	RME EPC is max detect	1 of 12
alpha-BHC	1.96E-05	2.00E-04	RME EPC is max detect	1 of 12
Aluminum	8.18E-02	2.60E-01	RME EPC is max detect	5 of 12
Aniline	1.30E-03	1.10E-02	RME EPC is max detect	1 of 12
Anthracene	4.30E-04	1.40E-03	RME EPC is max detect	2 of 12
Antimony	1.98E-02	4.30E-02	RME EPC is max detect	11 of 12
Arsenic	1.13E-02	2.80E-02	RME EPC is max detect	2 of 12
Barium	1.64E-01	1.38E+00	RME EPC is max detect	12 of 12
Benzene	1.02E+00	8.24E+00	RME EPC is max detect	7 of 16
Benzo(b)fluoranthene	3.23E-04	1.40E-03	RME EPC is max detect	1 of 12
Benzo(g,h,i)perylene	2.89E-04	1.50E-03	RME EPC is max detect	1 of 12
Benzoic Acid	1.10E-03	1.40E-03	RME EPC is max detect	5 of 12
beta-BHC	1.09E-05	8.30E-05	RME EPC is max detect	2 of 12
Bis(2-ethylhexyl)Phthalate	3.70E-03	6.00E-04	RME EPC is max detect	1 of 12
Boron	2.20E+00	3.44E+00	RME EPC is max detect	12 of 12
Carbazole	2.20E-03	7.70E-03	RME EPC is max detect	3 of 12
Carbon Tetrachloride	5.60E-01	7.58E+00	RME EPC is max detect	1 of 16
Chromium	9.10E-02	1.60E-01	RME EPC is max detect	12 of 12
cis-1,2-Dichloroethene	8.96E+00	1.24E+02	RME EPC is max detect	6 of 16
Cobalt	2.60E-03	1.60E-02	RME EPC is max detect	3 of 12
delta-BHC	5.97E-06	4.10E-05	RME EPC is max detect	2 of 12
Dibenz(a,h)anthracene	4.87E-04	2.90E-03	RME EPC is max detect	1 of 12
Dibenzofuran	6.01E-04	4.90E-03	RME EPC is max detect	1 of 12
Dieldrin	5.01E-06	2.64E-05	RME EPC is max detect	1 of 16
Endosulfan II	1.29E-05	1.20E-04	RME EPC is max detect	6 of 17
Endosulfan Sulfate	2.46E-06	1.56E-05	RME EPC is max detect	1 of 12
Endrin Aldehyde	1.31E-05	1.30E-04	RME EPC is max detect	1 of 12
Ethylbenzene	9.69E-02	7.40E-01	RME EPC is max detect	1 of 13
Fluorene	8.51E-04	6.10E-03	RME EPC is max detect	3 of 12
gamma-BHC (Lindane)	1.25E-04	1.50E-03	RME EPC is max detect	3 of 16
Heptachlor Epoxide	5.44E-06	2.50E-05	RME EPC is max detect	1 of 12
Indeno(1,2,3-cd)pyrene	4.73E-04	3.30E-03	RME EPC is max detect	1 of 12
Iron	1.31E+01	3.66E+01	RME EPC is max detect	12 of 12
Isopropylbenzene (Cumene)	2.80E-02	3.80E-02	RME EPC is max detect*	2 of 12
Lithium	3.19E-01	6.70E-01	RME EPC is max detect	12 of 12
m,p-Cresol	2.78E-03	1.20E-02	RME EPC is max detect	3 of 12
m,p-Xylene	6.85E-02	1.68E-01	RME EPC is max detect	1 of 12
Manganese	7.74E+00	2.69E+01	RME EPC is max detect	12 of 12
Methylene Chloride	9.57E+01	1.23E+03	RME EPC is max detect	4 of 16
Molybdenum	7.20E-03	5.50E-02	RME EPC is max detect	1 of 12
Naphthalene	7.83E-02	3.22E-01	RME EPC is max detect	1 of 13
Nickel	1.99E-02	1.40E-01	RME EPC is max detect	7 of 14
n-Propylbenzene	3.60E-02	3.10E-02	RME EPC is max detect*	1 of 12
o-Cresol	1.40E-03	8.10E-03	RME EPC is max detect	2 of 12
o-Xylene	4.62E-02	4.40E-02	RME EPC is max detect*	1 of 12
Phenanthrene	8.31E-04	6.40E-03	RME EPC is max detect	2 of 13
Pyrene	2.23E-04	5.00E-04	RME EPC is max detect	1 of 13
Silver	9.14E-03	1.70E-02	RME EPC is max detect	12 of 12
Strontium	1.10E+01	1.88E+01	RME EPC is max detect	12 of 12
Styrene	2.60E-02	2.50E-03	RME EPC is max detect*	1 of 12
Tetrachloroethene	1.95E+00	2.05E+01	RME EPC is max detect	4 of 16
Thallium	4.60E-03	3.00E-02	RME EPC is max detect	2 of 12
Titanium	1.20E-03	3.30E-03	RME EPC is max detect	3 of 12
Toluene	3.35E-01	4.05E+00	RME EPC is max detect	4 of 16
Trichloroethene	1.15E+01	8.40E+01	RME EPC is max detect	7 of 16
Vanadium	8.40E-03	2.40E-02	RME EPC is max detect	6 of 12
Vinyl Chloride	5.02E-01	5.09E+00	RME EPC is max detect	3 of 16
Xylene (total)	1.15E-01	2.12E-01	RME EPC is max detect	1 of 12

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected and because J flag data were used in the risk assessment.

* Chemicals of interest are any chemical measured in at least one sample.

⁽¹⁾ RME EPC is the reasonable maximum exposure point concentration.

TABLE 11
EXPOSURE POINT CONCENTRATIONS (mg/L)
WETLAND SURFACE WATER (TOTAL)

Chemical of Interest [*]	Average	Max Detection	Min Detection	TotRW _{Comb} ⁽¹⁾	RME EPC ⁽²⁾	Statistic Used	# of Detects/# of Samples
1,2-Dichloroethane	2.30E-03	3.85E-03	2.55E-03	1.96E-01	3.85E-03	RME EPC is max detect	3 of 4
Acrolein	1.21E-02	9.29E-03	9.29E-03	4.26E-01	9.30E-03	RME EPC is max detect*	1 of 4
Aluminum	5.08E-01	8.00E-01	1.70E-01	4.03E+02	8.00E-01	RME EPC is max detect	4 of 4
Barium	2.20E-01	3.70E-01	1.50E-01	6.49E+01	3.70E-01	RME EPC is max detect	4 of 4
Boron	1.96E+00	2.42E+00	8.30E-01	7.44E+01	2.42E+00	RME EPC is max detect	4 of 4
Chromium	1.49E-02	3.70E-02	2.00E-02	1.26E+02	3.70E-02	RME EPC is max detect	2 of 4
Chromium VI	3.13E-03	8.00E-03	8.00E-03	2.43E-01	8.00E-03	RME EPC is max detect	1 of 4
Copper	6.38E-03	1.10E-02	9.50E-03	3.31E+01	1.10E-02	RME EPC is max detect	2 of 4
Iron	6.45E-01	1.08E+00	1.90E-01	---	1.08E+00	RME EPC is max detect	4 of 4
Lithium	1.89E-01	2.50E-01	5.70E-02	1.65E+01	2.50E-01	RME EPC is max detect	4 of 4
Manganese	1.37E-01	3.40E-01	1.80E-02	4.09E+01	3.40E-01	RME EPC is max detect	4 of 4
Mercury	3.75E-05	7.00E-05	4.00E-05	0.0973	7.00E-05	RME EPC is max detect	2 of 4
Molybdenum	9.30E-03	1.50E-02	5.60E-03	3.47E+00	1.50E-02	RME EPC is max detect	3 of 4
Nickel	1.10E-03	2.20E-03	1.20E-03	1.13E+00	2.20E-03	RME EPC is max detect	2 of 4
Strontium	5.27E+00	6.64E+00	1.87E+00	3.38E+02	6.64E+00	RME EPC is max detect	4 of 4
Titanium	6.40E-03	9.80E-03	2.40E-03	8.67E+04	9.80E-03	RME EPC is max detect	4 of 4
Zinc	7.30E-03	2.20E-02	2.20E-02	2.01E+02	2.20E-02	RME EPC is max detect	1 of 4

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected, and because J flag data were used in the risk assessment.

* Chemicals of interest are any chemical measured in at least one sample.

⁽¹⁾ - From Tier 1 Contact Recreation Water PCLs. TCEQ, March 31, 2006.

⁽²⁾ RME EPC is the reasonable maximum exposure point concentration.

TABLE 12
EXPOSURE POINT CONCENTRATIONS (mg/L)
POND SURFACE WATER (TOTAL)

Chemical of Interest*	Average	Max Detection	Min Detection	TotRW _{Comb} (1)	RME EPC (2)	Statistic Used	# of Detects/# of Samples
4-Chloroaniline	2.79E-04	8.23E-04	8.23E-04	2.14E+00	8.00E-04	RME EPC is max detect	1 of 6
Aluminum	9.13E-01	2.22E+00	4.10E-01	4.03E+02	2.22E+00	RME EPC is max detect	5 of 6
Antimony	3.82E-03	7.60E-03	3.00E-03	1.99E-01	7.60E-03	RME EPC is max detect	3 of 6
Arsenic	5.40E-03	1.30E-02	1.20E-02	2.85E-02	1.30E-02	RME EPC is max detect	2 of 6
Barium	1.45E-01	1.90E-01	1.30E-01	6.49E+01	1.90E-01	RME EPC is max detect	6 of 6
Benzo(a)pyrene	1.12E-04	3.48E-04	3.48E-04	---	3.00E-04	RME EPC is max detect	1 of 6
Benzo(b)fluoranthene	4.03E-04	1.81E-03	1.81E-03	---	1.80E-03	RME EPC is max detect	1 of 6
Benzo(g,h,i)perylene	3.71E-04	1.73E-03	1.73E-03	---	1.70E-03	RME EPC is max detect	1 of 6
Benzo(k)fluoranthene	2.06E-04	5.42E-04	5.42E-04	---	5.00E-04	RME EPC is max detect	1 of 6
Bis(2-ethylhexyl)phthalate	1.92E-02	4.00E-02	2.90E-02	---	4.00E-02	RME EPC is max detect	3 of 6
Boron	2.97E+00	3.52E+00	2.45E+00	7.44E+01	3.52E+00	RME EPC is max detect	6 of 6
Chromium	8.50E-04	1.50E-03	1.50E-03	1.26E+02	1.50E-03	RME EPC is max detect	1 of 6
Chromium VI	8.50E-03	1.60E-02	1.50E-02	2.43E-01	1.60E-02	RME EPC is max detect	2 of 6
Chrysene	2.48E-04	7.10E-04	7.10E-04	---	7.00E-04	RME EPC is max detect	1 of 6
Cobalt	9.12E-04	3.20E-03	5.20E-04	5.33E+01	3.20E-03	RME EPC is max detect	2 of 6
Dibenz(a,h)anthracene	6.26E-04	3.04E-03	3.04E-03	---	3.00E-03	RME EPC is max detect	1 of 6
Di-n-butyl Phthalate	3.12E-03	3.81E-03	1.07E-03	4.49E+00	3.80E-03	RME EPC is max detect	5 of 6
Indeno(1,2,3-cd)pyrene	6.73E-04	3.44E-03	3.44E-03	---	3.40E-03	RME EPC is max detect	1 of 6
Iron	2.27E+00	6.67E+00	5.20E-01	---	6.67E+00	RME EPC is max detect	6 of 6
Lead	2.63E-03	1.10E-02	1.10E-02	---	1.10E-02	RME EPC is max detect	1 of 6
Lithium	1.16E-01	1.60E-01	6.70E-02	1.65E+01	1.60E-01	RME EPC is max detect	6 of 6
Manganese	6.37E-01	1.44E+00	8.50E-02	4.09E+01	1.44E+00	RME EPC is max detect	6 of 6
Molybdenum	8.73E-03	1.80E-02	1.30E-02	3.47E+00	1.80E-02	RME EPC is max detect	3 of 6
Nickel	4.60E-03	7.90E-03	3.00E-03	1.13E+01	7.90E-03	RME EPC is max detect	6 of 6
Selenium	4.26E-03	9.80E-03	9.80E-03	4.13E+00	9.80E-03	RME EPC is max detect	1 of 6
Silver	9.30E-03	1.50E-02	3.70E-03	1.57E+00	1.50E-02	RME EPC is max detect	6 of 6
Strontium	4.47E+00	7.19E+00	1.77E+00	3.38E+02	7.19E+00	RME EPC is max detect	6 of 6
Thallium	2.86E-03	7.70E-03	6.20E-03	6.61E-02	7.70E-03	RME EPC is max detect	2 of 6
Titanium	1.90E-02	4.40E-02	2.10E-03	8.67E+04	4.40E-02	RME EPC is max detect	6 of 6
Vanadium	3.20E-03	8.40E-03	4.30E-03	1.08E+00	8.40E-03	RME EPC is max detect	3 of 6
Zinc	1.20E-01	6.30E-01	2.70E-02	2.01E+02	6.30E-01	RME EPC is max detect	3 of 6

Notes:

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

(1) - From Tier 1 Contact Recreation Water PCLs. TCEQ, March 31, 2006.

(2) RME EPC is the reasonable maximum exposure point concentration.

TABLE 13
EXPOSURE POINT CONCENTRATIONS (mg/kg)
WETLAND SEDIMENT

Chemical of Interest [†]	Average	Max Detection	Min Detection	TotSed _{Comb} ⁽¹⁾	95% UCL	Statistic Used ⁽²⁾	# of Detects/# of Samples
1,2-Dichloroethane	2.49E-04	2.40E-03	1.83E-03	6.0E+02	5.90E-04	95% Chebyshev	3 of 48
2-Methylnaphthalene	2.46E-02	4.30E-01	1.22E-02	4.9E+02	1.16E-01	99% Chebyshev	4 of 48
4,4'-DDT	9.52E-04	9.22E-03	9.29E-04	8.7E+01	2.20E-03	97.5% Chebyshev	16 of 55
Acenaphthene	1.95E-02	1.33E-01	1.60E-02	7.4E+03	6.40E-02	99% Chebyshev	4 of 48
Acenaphthylene	3.14E-02	5.45E-01	2.91E-02	7.4E+03	1.65E-01	99% Chebyshev	4 of 48
Aluminum	1.32E+04	1.82E+04	3.40E+03	1.5E+05	1.40E+04	95% Student's-t	48 of 48
Anthracene	2.88E-02	3.34E-01	8.38E-03	3.7E+04	1.26E-01	99% Chebyshev	8 of 48
Antimony ⁽³⁾	1.15E+00	4.24E+00	4.60E-01	8.3E+01	1.61E+00	95% Chebyshev	40 of 48
Arsenic	2.53E+00	1.28E+01	1.00E+00	1.1E+02	3.40E+00	95% Approx. Gamma	35 of 48
Barium	1.52E+02	8.20E+02	3.60E+01	2.3E+04	2.38E+02	95% Chebyshev	48 of 48
Benzo(a)anthracene	5.43E-02	9.93E-01	5.46E-02	1.6E+01	3.06E-01	99% Chebyshev	5 of 48
Benzo(a)pyrene	1.04E-01	1.30E+00	1.76E-02	1.6E+00	4.76E-01	99% Chebyshev	15 of 48
Benzo(b)fluoranthene	9.02E-02	1.36E+00	1.62E-02	1.6E+01	4.31E-01	99% Chebyshev	19 of 48
Benzo(g,h,i)perylene	1.98E-01	1.94E+00	4.40E-02	3.7E+03	7.55E-01	99% Chebyshev	24 of 48
Benzo(k)fluoranthene	6.59E-02	7.30E-01	6.92E-02	1.6E+02	2.37E-01	99% Chebyshev	14 of 48
Beryllium	8.94E-01	1.37E+00	2.80E-01	2.7E+01	9.43E-01	95% Student's-t	48 of 48
Boron ⁽³⁾	1.45E+01	4.62E+01	5.17E+00	1.1E+05	3.20E+01	99% Chebyshev	24 of 48
Cadmium	1.03E-01	4.80E-01	3.30E-02	1.1E+03	3.13E-01	99% Chebyshev	20 of 48
Carbazole	1.92E-02	1.41E-01	1.58E-02	7.1E+02	6.45E-02	99% Chebyshev	5 of 48
Carbon Disulfide	5.25E-04	6.99E-03	3.34E-03	7.3E+04	2.60E-03	99% Chebyshev	4 of 48
Chromium	1.51E+01	4.46E+01	8.96E+00	3.6E+04	1.64E+01	95% Student's-t	48 of 48
Chromium VI	9.56E-01	4.04E+00	1.30E+00	1.4E+02	3.36E+00	99% Chebyshev	6 of 25
Chrysene	2.17E-01	4.05E+00	1.10E-02	1.6E+03	1.24E+00	99% Chebyshev	19 of 48
Cobalt	6.98E+00	9.89E+00	3.00E+00	3.2E+04	7.32E+00	95% Student's-t	48 of 48
Copper	1.45E+01	4.90E+01	5.44E+00	2.1E+04	1.66E+01	95% Student's-t	48 of 48
Dibenz(a,h)anthracene	2.03E-01	2.91E+00	1.29E-01	1.6E+00	1.10E+00	99% Chebyshev	6 of 48
Dibenzofuran	1.39E-02	8.00E-02	1.00E-02	6.1E+02	2.50E-02	95% Chebyshev	3 of 48
Endosulfan Sulfate	1.80E-03	6.00E-02	7.31E-03	9.2E+02	1.44E-02	99% Chebyshev	3 of 48
Endrin Aldehyde	1.00E-03	1.00E-02	5.66E-04	4.6E+01	4.30E-03	99% Chebyshev	9 of 48
Endrin Ketone	7.85E-04	1.30E-02	3.29E-03	4.6E+01	2.00E-03	95% Chebyshev	3 of 48
Fluoranthene	1.08E-01	2.17E+00	1.20E-02	4.9E+03	6.37E-01	99% Chebyshev	13 of 48
Fluorene	1.86E-02	1.39E-01	1.50E-02	4.9E+03	6.37E-02	99% Chebyshev	4 of 48
gamma-Chlordane	4.05E-04	3.60E-03	7.69E-04	4.1E+01	8.27E-04	95% Chebyshev	4 of 48
Indeno(1,2,3-cd)pyrene	2.01E-01	1.94E+00	6.28E-02	1.6E+01	7.85E-01	99% Chebyshev	23 of 48
Iron	1.72E+04	6.09E+04	1.11E+04	---	1.88E+04	95% Student's-t	48 of 48
Lead	2.54E+01	2.37E+02	9.40E+00	5.0E+02	4.68E+01	95% Chebyshev	48 of 48
Lithium	1.87E+01	2.76E+01	5.43E+00	1.1E+04	1.96E+01	95% Student's-t	48 of 48
Manganese	3.32E+02	1.01E+03	8.76E+01	1.4E+04	3.83E+02	95% Approx. Gamma	48 of 48
Mercury	1.99E-02	8.10E-02	6.10E-03	3.4E+01	2.68E-02	95% H-UCL	26 of 48
Molybdenum	5.81E-01	3.24E+00	1.30E-01	1.8E+03	7.63E-01	95% Approx. Gamma	38 of 48
Nickel	1.73E+01	2.77E+01	1.09E+01	1.4E+03	1.81E+01	95% Student's-t	48 of 48
Phenanthrene	7.61E-02	1.30E+00	2.30E-02	3.7E+03	4.32E-01	99% Chebyshev	12 of 48
Pyrene	1.54E-01	1.64E+00	1.59E-02	3.7E+03	6.63E-01	99% Chebyshev	19 of 48
Strontium	6.70E+01	3.30E+02	1.88E+01	1.5E+05	7.64E+01	95% H-UCL	48 of 48
Tin ⁽³⁾	6.38E-01	4.61E+00	3.45E+00	9.2E+04	1.26E+00	95% Chebyshev	4 of 48
Titanium	2.91E+01	6.87E+01	8.15E+00	1.0E+06	3.27E+01	95% Approx. Gamma	48 of 48
Toluene	6.55E-04	2.14E-03	1.57E-03	5.9E+04	1.20E-03	95% Chebyshev	3 of 48
Vanadium	2.17E+01	3.20E+01	9.02E+00	3.3E+02	2.28E+01	95% Student's-t	48 of 48
Zinc	1.39E+02	9.03E+02	3.15E+01	7.6E+04	2.36E+02	95% Chebyshev	53 of 53

Notes:

[†] Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

⁽¹⁾ - TotSed_{Comb} PCL = TCEQ Protective Concentration Level for total sediment combined pathway (includes inhalation; ingestion; dermal pathways).

⁽²⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

⁽³⁾ - Samples 2WSED8, SWSED10, 4WSED2, and 4WSED3 were re-analyzed for antimony, boron, and tin because the initial data indicated concentrations much higher than data for the rest of the samples although QA/QC indicated that they were acceptable. The re-analysis was run twice with good concurrence between the two re-analyses but with very different values from the original so the first re-analyzed value was used in the UCL calculation.

TABLE 14
EXPOSURE POINT CONCENTRATIONS (mg/kg)
POND SEDIMENT

Chemical of Interest*	Average	Max Detection	Min Detection	TotSed _{comb} ⁽¹⁾	RME EPC	Statistic Used ⁽²⁾	# of Detects/# of Samples
2,4,6-Trichlorophenol	1.75E-02	4.29E-02	4.29E-02	1.3E+03	4.29E-02	RME EPC is max detect	1 of 8
4,4'-DDD	6.98E-03	6.76E-04	6.76E-04	1.2E+02	6.76E-04	RME EPC is max detect*	3 of 8
4,4'-DDT	4.16E-03	1.57E-03	1.11E-03	8.7E+01	1.57E-03	RME EPC is max detect*	1 of 8
Acetone	2.38E-02	7.98E-02	7.98E-02	6.6E+05	7.98E-02	RME EPC is max detect	1 of 8
Aluminum	1.17E+04	1.63E+04	7.99E+03	1.5E+05	1.63E+04	RME EPC is max detect	8 of 8
Antimony	7.95E-01	1.85E+00	3.30E-01	8.3E+01	1.85E+00	RME EPC is max detect	8 of 8
Arsenic	1.74E+00	5.01E+00	3.39E+00	1.1E+02	5.01E+00	RME EPC is max detect	3 of 8
Barium	1.99E+02	4.17E+02	1.08E+02	2.3E+04	4.17E+02	RME EPC is max detect	8 of 8
Benzo(b)fluoranthene	4.77E-02	1.06E-01	2.93E-02	1.6E+01	1.06E-01	RME EPC is max detect	6 of 8
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	1.35E-01	3.7E+03	1.35E-01	RME EPC is max detect	1 of 8
Benzo(k)fluoranthene	5.27E-02	1.30E-01	1.10E-01	1.6E+02	1.30E-01	RME EPC is max detect	3 of 8
Beryllium	8.34E-01	1.13E+00	5.80E-01	2.7E+01	1.13E+00	RME EPC is max detect	8 of 8
beta-BHC	7.96E-03	6.99E-04	6.99E-04	1.4E+01	7.00E-04	RME EPC is max detect*	1 of 8
Boron	1.50E+01	2.84E+01	1.10E+01	1.1E+05	2.84E+01	RME EPC is max detect	5 of 8
Bromomethane	8.90E-03	3.10E-02	1.40E-02	1.0E+03	3.10E-02	RME EPC is max detect	2 of 8
Cadmium	1.47E-01	2.70E-01	1.90E-01	1.1E+03	2.70E-01	RME EPC is max detect	5 of 8
Carbon Disulfide	1.40E-03	7.71E-03	7.71E-03	7.3E+04	7.70E-03	RME EPC is max detect	1 of 8
Chromium	1.29E+01	2.01E+01	8.29E+00	3.6E+04	2.01E+01	RME EPC is max detect	8 of 8
Chrysene	9.50E-03	2.57E-02	2.57E-02	1.6E+03	2.57E-02	RME EPC is max detect	1 of 8
Cobalt	6.94E+00	8.99E+00	5.19E+00	3.2E+04	8.99E+00	RME EPC is max detect	8 of 8
Copper	1.52E+01	2.68E+01	8.33E+00	2.1E+04	2.68E+01	RME EPC is max detect	8 of 8
Iron	1.53E+04	2.01E+04	1.13E+04	—	2.01E+04	RME EPC is max detect	8 of 8
Lead	1.75E+01	3.05E+01	1.06E+01	5.0E+02	3.05E+01	RME EPC is max detect	8 of 8
Lithium	1.85E+01	2.37E+01	1.35E+01	1.1E+04	2.37E+01	RME EPC is max detect	8 of 8
m,p-Cresol	1.49E-02	3.75E-02	3.75E-02	—	3.75E-02	RME EPC is max detect	1 of 8
Manganese	4.88E+02	7.11E+02	3.52E+02	1.4E+04	7.11E+02	RME EPC is max detect	8 of 8
Methyl Iodide	8.10E-03	4.10E-02	4.10E-02	1.0E+03	1.11E-02	RME EPC is max detect	1 of 8
Molybdenum	1.46E-01	6.00E-01	2.10E-01	1.8E+03	6.00E-01	RME EPC is max detect	2 of 8
Nickel	1.63E+01	2.06E+01	1.23E+01	1.4E+03	2.06E+01	RME EPC is max detect	8 of 8
Pyrene	1.47E-02	2.65E-02	2.01E-02	3.7E+03	2.65E-02	RME EPC is max detect	3 of 8
Strontium	1.04E+02	1.81E+02	6.33E+01	1.5E+05	1.81E+02	RME EPC is max detect	8 of 8
Titanium	3.00E+01	4.05E+01	1.91E+01	1.0E+06	4.05E+01	RME EPC is max detect	8 of 8
Vanadium	2.18E+01	2.74E+01	1.68E+01	3.3E+02	2.74E+01	RME EPC is max detect	8 of 8
Zinc	3.32E+02	9.99E+02	3.82E+01	7.6E+04	9.99E+02	RME EPC is max detect	8 of 8

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected, and because J flagged (estimated) data were used in the risk assessment.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent. Bolded compounds have a maximum concentration that exceeded the screening value.

(1) - TotSed_{comb} PCL = TCEQ Protective Concentration Level for total sediment combined pathway (includes inhalation; ingestion; dermal pathways).

(2) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 15
EXPOSURE POINT CONCENTRATIONS (mg/kg)
BACKGROUND SOIL+

Chemical of Interest ⁺⁺	Average	Max Detection	Min Detection	TotSoil _{comb} ⁽¹⁾	EPA Region 6 Soil Screening Criteria ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
Antimony	0.953	2.19	0.25	3.1E+02	4.5E+02	2.19	Maximum*	5 of 10
Arsenic	3.438	5.9	0.24	2.0E+02	1.8E+00	4.477	95% Student's-t	10 of 10
Barium	333.1	1130	150	8.9E+04	7.9E+04	502.3	95% Approx. Gamma	10 of 10
Benzo(a)anthracene	0.0116	0.082	0.082	2.4E+01	2.3E+00	0.0457	95% Chebyshev	1 of 10
Benzo(a)pyrene	0.0122	0.076	0.076	2.4E+00	2.3E-01	0.0431	95% Chebyshev	1 of 10
Benzo(b)fluoranthene	0.00941	0.057	0.057	2.4E+01	2.3E+00	0.0325	95% Chebyshev	1 of 10
Benzo(g,h,i)perylene	0.0241	0.083	0.083	1.9E+04	---	0.0527	95% Chebyshev	1 of 10
Benzo(k)fluoranthene	0.0158	0.106	0.106	2.4E+02	2.3E+01	0.0595	95% Chebyshev	1 of 10
Cadmium	0.0311	0.11	0.041	8.5E+02	5.6E+02	0.11	Maximum*	3 of 10
Carbazole	0.00512	0.011	0.011	9.5E+02	9.6E+01	0.00636	95% Student's-t	1 of 10
Chromium	15.2	20.1	10.7	5.7E+04	5.0E+02	16.95	95% Student's-t	10 of 10
Chrysene	0.0145	0.083	0.083	2.4E+03	2.3E+02	0.0477	95% Chebyshev	1 of 10
Copper	12.12	19.3	7.68	3.7E+04	4.2E+04	14.41	95% Student's-t	10 of 10
Fluoranthene	0.0208	0.156	0.156	2.5E+04	2.4E+04	0.156	Maximum*	1 of 10
Indeno(1,2,3-cd)pyrene	0.0551	0.417	0.417	2.4E+01	2.3E+00	0.417	Maximum*	1 of 10
Lead	13.43	15.2	11	1.6E+03	8.0E+02	14.33	95% Student's-t	10 of 10
Lithium	21.14	32.5	14.4	1.9E+03	2.3E+04	24.13	95% Student's-t	10 of 10
Manganese	377.4	551	284	2.4E+04	3.5E+04	431.8	95% Student's-t	10 of 10
Mercury	0.0213	0.03	0.015	3.3E+00	3.4E+02	0.0241	95% Student's-t	10 of 10
Molybdenum	0.522	0.68	0.42	4.5E+03	5.7E+03	0.565	95% Student's-t	10 of 10
Phenanthrene	0.0167	0.137	0.137	1.9E+04	---	0.137	Maximum*	1 of 10
Pyrene	0.0218	0.127	0.127	1.9E+04	3.2E+04	0.0728	95% Chebyshev	1 of 10
Zinc	247	969	36.6	2.5E+05	1.0E+05	969	Maximum*	10 of 10

Notes:

* Recommended UCL exceeds maximum observation, so the maximum measured concentration was used as the EPC.

+ Soil was collected from 0 to 4 ft. below ground surface.

++ Chemicals of Interest are any chemical measured in at least one sample. Bolded compounds have a maximum concentration that exceeded the screening value.

(1) - TotSoil_{comb} PCL = TCEQ Protective Concentration Level for 30 acre source area Commercial/Industrial total soil combined pathway (includes inhalation; ingestion; dermal pathways).

(2) - From EPA's "Region 6 Human Health Medium-Specific Screening Levels 2004-2005". Industrial Outdoor Worker.

(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

**TABLE 16
BACKGROUND COMPARISONS**

HYPOTHESIS TESTED: ARE SITE DATA STATISTICALLY DIFFERENT THAN BACKGROUND DATA?⁽¹⁾							
CHEMICAL OF INTEREST	SOUTH AREA SURFACE SOIL	SOUTH AREA SOIL	NORTH AREA SURFACE SOIL	NORTH AREA SOIL	INTRACOASTAL WATERWAY SEDIMENT	WETLANDS SEDIMENT	POND SEDIMENT
Aluminum	NA	NA	NA	NA	Yes*	NA	NA
Antimony	No	No	No	No	Yes*	No	No
Arsenic	No	No	No	No	Yes*	No	Yes*
Barium	No	No	Yes*	Yes*	No	Yes*	No
Beryllium	NA	NA	NA	NA	Yes*	NA	NA
Boron	NA	NA	NA	NA	Yes*	NA	NA
Cadmium	No	No	Yes	Yes*	NA	Yes	Yes
Chromium	No	No	No	No	NA	No	No
Cobalt	NA	NA	NA	NA	Yes*	NA	NA
Copper	Yes	No	No	No	No	No	No
Iron	NA	NA	NA	NA	No	NA	No
Lead	Yes	No	No	No	No	No	Yes
Lithium	Yes*	Yes*	Yes*	No	Yes*	No	No
Manganese	Yes*	Yes*	No	No	No	No	Yes
Mercury	No	No	Yes*	Yes*	No	No	NA
Molybdenum	Yes	No	No	No	No	No	Yes*
Nickel	NA	NA	NA	NA	No	NA	NA
Strontium	NA	NA	NA	NA	Yes*	NA	NA
Titanium	NA	NA	NA	NA	Yes*	NA	NA
Vanadium	NA	NA	NA	NA	Yes*	NA	NA
Zinc	Yes	No	No	No	No	No	No

Notes:

⁽¹⁾ Detailed statistical procedures are outlined in Section 2.2.2 and calculations are provided in Appendix B.

* Statistical difference is due to background being greater than site.

NA - No analysis was performed for compound in background.

TABLE 17
PCOCS IDENTIFIED AND QUANTITATIVELY EVALUATED IN THE BHHRA*

SOUTH AREA SOIL**	NORTH AREA SOIL**	INTRACOASTAL WATERWAY SURFACE WATER	INTRACOASTAL WATERWAY SEDIMENT	WETLANDS SURFACE WATER	WETLANDS SEDIMENT	POND SURFACE WATER	POND SEDIMENT
4,4'-DDD Aluminum Aroclor-1254 Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Dibenz(a,h)anthracene Dieldrin Indeno(1,2,3-cd)pyrene Iron Isopropylbenzene (cumene) Lead Naphthalene	1,2-Dichloroethane Aluminium Aroclor-1254 Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Iron Tetrachloroethene	none+	Benzo(a)pyrene Dibenz(a,h)anthracene Iron	none+	Aluminum Benzo(a)pyrene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Iron	none+	Aluminum Iron m,p-Cresol

Notes:

* Groundwater was not included in the table because all compounds measured in groundwater were evaluated quantitatively in the BHHRA.

** Soil includes both surface and subsurface soil for the purposes of this table.

+ All COIs for surface water screened out, as discussed in Section 2.2.1.

**TABLE 18
EXPOSURE SCENARIOS BY MEDIA**

MEDIA	Future On-Site Industrial Worker Receptor	Future On-Site Construction Worker Receptor	Potential Current Youth Trespasser	Potential Current Contact Recreation	Potential Current Off-Site Residential Receptor
South Area Surface Soil	X ⁽¹⁾	X ⁽¹⁾	X ⁽¹⁾		X ⁽²⁾
South Area Soil	X ⁽¹⁾	X ⁽¹⁾	X ⁽¹⁾		X ⁽³⁾
South Area Groundwater	X ⁽⁶⁾				
Intracoastal Waterway Surface Water				X ⁽⁴⁾	
Intracoastal Waterway Sediment				X ⁽⁵⁾	
Intracoastal Waterway Fish					X*
North Area Surface Soil	X ⁽¹⁾	X ⁽¹⁾	X ⁽¹⁾		
North Area Soil	X ⁽¹⁾	X ⁽¹⁾	X ⁽¹⁾		
North Area Groundwater	X ⁽⁷⁾				
North Area Wetlands Surface Water		X*	X ⁽¹²⁾	X ⁽⁸⁾	
North Area Wetlands Sediment		X*	X ⁽¹²⁾	X ⁽⁹⁾	
North Area Ponds Surface Water		X*	X ⁽¹²⁾	X ⁽¹⁰⁾	
North Area Ponds Sediment		X*	X ⁽¹²⁾	X ⁽¹¹⁾	

Notes:

* EPA-approved fish ingestion pathway risk assessment (PBW, 2007) concluded that this pathway does not pose a human health threat.

+ Exposure for this receptor was not quantified since exposure would be approximately four times less than the acceptable risk calculated for the contact recreation receptor. due to the less exposure incurred for the worker given the differences in exposure frequency and duration.

⁽¹⁾ Risks presented in Table 23.

⁽²⁾ Risks presented in Table 24.

⁽³⁾ Risks presented in Table 25.

⁽⁴⁾ Screening evaluation presented in Table 4.

⁽⁵⁾ Screening evaluation presented in Table 6.

⁽⁶⁾ Risks presented in Table 26.

⁽⁷⁾ Risks presented in Table 27.

⁽⁸⁾ Screening evaluation presented in Table 11.

⁽⁹⁾ Screening evaluation presented in Table 13.

⁽¹⁰⁾ Screening evaluation presented in Table 12.

⁽¹¹⁾ Screening evaluation presented in Table 14.

⁽¹²⁾ Trespasser risks were assumed to be equivalent to the contact recreation receptor.

TABLE 19
EXPOSURE ASSUMPTIONS FOR THE INDUSTRIAL WORKER SCENARIO

PARAMETER	DEFINITION	AVERAGE VALUE	REFERENCE	RME VALUE	REFERENCE
PEF	Particulate Emission Factor (m ³ /kg)	1.00E+09	EPA, 2004a	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	50	EPA, 2004a	50	EPA, 2004a
SA	Skin surface area (cm ²)	3300	EPA, 2004a	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm ²)	0.021	EPA, 2001a	0.2	EPA, 2004a
EF	Exposure frequency (day/yr)	250	EPA, 2004a	250	EPA, 2004a
ED	Exposure duration (yr)	25	EPA, 2004a	25	EPA, 2004a
BW	Body weight (kg)	70	EPA, 1989	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989	9125	EPA, 1989

TABLE 20
EXPOSURE ASSUMPTIONS FOR THE CONSTRUCTION WORKER SCENARIO

PARAMETER	DEFINITION	AVERAGE		RME	
		VALUE	REFERENCE	VALUE	REFERENCE
PEF	Particulate Emission Factor (m ³ /kg)	1.00E+09	EPA, 2004a	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	165	professional judgment	330	EPA, 2001
SA	Skin surface area (cm ²)	3300	EPA, 2004a	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm ²)	0.14	EPA, 2004b	0.3	EPA, 2004b
EF	Exposure frequency (day/yr)	90	professional judgment	250	professional judgment
ED	Exposure duration (yr)	1	professional judgment	1	professional judgment
BW	Body weight (kg)	70	EPA, 1989	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	365	EPA, 1989	365	EPA, 1989

TABLE 21
EXPOSURE ASSUMPTIONS FOR THE YOUTH TRESPASSER SCENARIO

PARAMETER	DEFINITION	AVERAGE VALUE	REFERENCE	RME VALUE	REFERENCE
PEF	Particulate Emission Factor (m ³ /kg)	1.00E+09	EPA, 2004a	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	100	TNRCC, 1998	100	TNRCC, 1998
SA	Skin surface area (cm ²)	3500	TNRCC, 1998	3500	TNRCC, 1998
AF	Soil to skin adherence factor (mg/cm ²)	0.1	TNRCC, 1998	0.1	TNRCC, 1998
EF	Exposure frequency (day/yr)	25	professional judgment	50	TNRCC, 1998
ED	Exposure duration (yr)	6	professional judgment	12	TNRCC, 1998
BW	Body weight (kg)	40	EPA, 1991a	40	EPA, 1991a
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989	9125	EPA, 1989

TABLE 22
EXPOSURE ASSUMPTIONS FOR THE CONTACT RECREATION SCENARIO

PARAMETER	DEFINITION	AVERAGE VALUE	REFERENCE	RME VALUE	REFERENCE
IR	Ingestion rate of soil or sediment (mg/day)	100	TCEQ, 2002	100	TCEQ, 2002
SA	Skin surface area (cm ²)	4400	TCEQ, 2002	4400	TCEQ, 2002
AF	Sediment to skin adherence factor (mg/cm ²)	0.3	TCEQ, 2002	0.3	TCEQ, 2002
EF	Exposure frequency (day/yr)	19	professional judgment	39	TCEQ, 2002
ED	Exposure duration (yr)	13	professional judgment	25	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989	9125	EPA, 1989

TABLE 23
QUALITATIVE CURRENT OFF-SITE RESIDENTIAL RECEPTOR EVALUATION
SOUTH AREA SURFACE SOIL*

Chemical of Interest [*]	Average	Max Detection	Min Detection	Air Soil _{inh-v} ⁽¹⁾	95% UCL	Statistic Used ⁽²⁾	# of Detects/# of Samples
2-Methylnaphthalene	0.0293	0.501	0.0106	---	0.0784	97.5% Chebyshev	22 of 83
4,4'-DDD	0.0007894	0.0243	0.00264	---	0.0029	97.5% Chebyshev	5 of 83
4,4'-DDE	0.0019	0.0693	0.000428	---	0.0074	97.5% Chebyshev	17 of 83
4,4'-DDT	0.0038	0.0625	0.000281	6.2E+02	0.014	99% Chebyshev	37 of 83
Acenaphthene	0.0595	1.69	0.0113	---	0.197	97.5% Chebyshev	26 of 83
Acenaphthylene	0.0382	0.935	0.0184	---	0.113	97.5% Chebyshev	19 of 83
Aluminum	5335	15200	414	---	5946	95% Student's-t	83 of 83
Anthracene	0.0961	2.46	0.0112	---	0.297	97.5% Chebyshev	37 of 83
Antimony	1.118	5.14	0.2	---	1.959	97.5% Chebyshev	72 of 83
Aroclor-1254	0.137	7.98	0.00334	---	0.726	97.5% Chebyshev	13 of 85
Arsenic	3.735	24.3	0.26	---	4.535	95% Approx. Gamma	71 of 83
Barium	345.2	2180	18.6	---	415.1	95% H-UCL	83 of 83
Benzo(a)anthracene	0.345	5.02	0.0286	1.9E+03	1.211	99% Chebyshev	30 of 83
Benzo(a)pyrene	0.457	4.57	0.0103	4.4E+02	1.457	99% Chebyshev	65 of 83
Benzo(b)fluoranthene	0.582	5.42	0.0408	3.2E+03	1.638	95% H-UCL	61 of 83
Benzo(g,h,i)perylene	0.324	4.24	0.00989	---	1.095	99% Chebyshev	51 of 83
Benzo(k)fluoranthene	0.24	4.25	0.0195	7.8E+04	0.651	97.5% Chebyshev	33 of 83
Beryllium	0.408	4.6	0.014	---	0.487	95% Approx. Gamma	82 of 83
Boron	4.662	54.4	2.43	---	9.663	97.5% Chebyshev	34 of 83
Butyl Benzyl Phthalate	0.0187	0.297	0.0129	1.30E+04	0.0373	95% Chebyshev	6 of 83
Cadmium	0.464	9.71	0.023	---	1.71	99% Chebyshev	50 of 83
Carbazole	0.0612	1.54	0.0104	---	0.193	97.5% Chebyshev	29 of 83
Chromium	16.08	136	3.37	---	17.45	95% H-UCL	83 of 83
Chrysene	0.409	4.87	0.00932	3.0E+05	1.322	99% Chebyshev	56 of 83
Cobalt	3.705	16	0.049	---	4.781	95% Chebyshev	82 of 83
Copper	27.98	216	1.55	---	32.45	95% H-UCL	83 of 83
Dibenz(a,h)anthracene	0.155	1.64	0.0639	1.0E+03	0.363	97.5% Chebyshev	36 of 83
Dibenzofuran	0.0378	0.821	0.0167	---	0.111	97.5% Chebyshev	17 of 83
Dieldrin	0.000997	0.0205	0.000243	1.6E+01	0.003	97.5% Chebyshev	21 of 83
Di-n-butyl Phthalate	0.048	0.753	0.0368	1.5E+04	0.0967	95% Chebyshev	9 of 83
Endosulfan Sulfate	0.002	0.0713	0.000456	---	0.0077	97.5% Chebyshev	17 of 83
Endrin Aldehyde	0.0023	0.0738	0.000497	---	0.0084	97.5% Chebyshev	22 of 83
Endrin Ketone	0.0016	0.02	0.000469	9.7E+02	0.004	97.5% Chebyshev	18 of 83
Fluoranthene	0.799	14.2	0.0133	---	2.656	95% H-UCL	59 of 83
Fluorene	0.0515	1.11	0.00945	---	0.155	97.5% Chebyshev	28 of 83
gamma-Chlordane	0.00082679	0.0156	0.00071	5.0E+02	0.0025	97.5% Chebyshev	8 of 83
Indeno(1,2,3-cd)pyrene	0.47	6.49	0.0634	1.3E+04	1.115	97.5% Chebyshev	63 of 83
Iron	16285	77100	3450	---	17845	95% H-UCL	83 of 83
Lead	69.61	643	2.82	---	84.5	95% H-UCL	83 of 83
Lithium	7.856	28	0.65	---	9.055	95% Approx. Gamma	83 of 83
Manganese	257.4	892	59.3	---	281.1	95% Student's-t	83 of 83
Mercury	0.0227	0.66	0.0032	2.4E+00	0.0254	95% H-UCL	37 of 83
Molybdenum	1.306	8.42	0.098	---	1.645	95% Approx. Gamma	71 of 83
Nickel	11.64	36.7	2.84	---	12.54	95% Approx. Gamma	83 of 83
Phenanthrene	0.512	12.6	0.0139	---	2.198	99% Chebyshev	57 of 83
Pyrene	0.533	8.47	0.0121	---	1.366	95% H-UCL	57 of 83
Strontium	70.61	527	16.5	---	101.2	95% Chebyshev	83 of 83
Tin	0.611	4.95	0.52	---	0.991	95% Chebyshev	23 of 83
Titanium	29.8	645	11.5	---	63	95% Chebyshev	83 of 83
Vanadium	13.76	45.6	5.42	---	14.84	95% Approx. Gamma	83 of 83

* Surface soil was collected from 0 to 0.5 ft. below ground surface.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

⁽¹⁾ - $Air\ Soil_{inh-v}$ PCL = TCEQ protective concentration Level for 30 acre source area Residential soil-to-air pathway (inhalation of volatiles and particulates).

⁽²⁾ - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 24
QUALITATIVE CURRENT OFF-SITE RESIDENTIAL RECEPTOR EVALUATION
SOUTH AREA SOIL*

Chemical of Interest ⁺	Average	Max Detection	Min Detection	Air Soil _{inh-V} ⁽¹⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
1,3,5-Trimethylbenzene	0.099	4.36	0.000267	6.0E+01	0.532	97.5% Chebyshev	9 of 83
2-Butanone	0.00412	0.0226	0.000992	5.9E+04	0.00925	97.5% Chebyshev	4 of 83
2-Hexanone	0.00406	0.0207	0.00109	5.7E+01	0.0164	97.5% Chebyshev	8 of 83
2-Methylnaphthalene	0.0698	7.21	0.0106	---	0.341	97.5% Chebyshev	32 of 166
4,4'-DDD	0.00766	1.12	0.000369	---	0.0498	97.5% Chebyshev	21 of 166
4,4'-DDE	0.0017	0.0693	0.000428	---	0.0054	97.5% Chebyshev	22 of 166
4,4'-DDT	0.0037	0.113	0.000281	6.2E+02	0.0125	99% Chebyshev	68 of 166
Acenaphthene	0.0419	1.69	0.0113	---	0.115	97.5% Chebyshev	35 of 166
Acenaphthylene	0.042	1.2	0.0172	---	0.114	97.5% Chebyshev	37 of 166
Acetone	0.0145	0.16	0.031	5.8E+03	0.0491	99% Chebyshev	10 of 83
Aluminum	6452	15700	414	---	6914	95% Student's-t	166 of 166
Anthracene	0.0874	2.46	0.0112	---	0.21	97.5% Chebyshev	65 of 166
Antimony	1.023	5.51	0.2	---	1.576	97.5% Chebyshev	144 of 166
Aroclor-1254	0.205	11.5	0.00334	---	0.74	97.5% Chebyshev	25 of 170
Arsenic	3.331	24.3	0.23	---	4.916	97.5% Chebyshev	139 of 166
Barium	237.4	2180	18.6	---	330.4	95% Chebyshev	166 of 166
Benzene	0.004	0.0221	0.000339	8.40E+01	0.0065	97.5% Chebyshev	72 of 83
Benzo(a)anthracene	0.268	5.02	0.0118	1.9E+03	0.859	99% Chebyshev	44 of 166
Benzo(a)pyrene	0.347	4.88	0.00999	4.4E+02	1.008	99% Chebyshev	113 of 166
Benzo(b)fluoranthene	0.466	5.97	0.0408	3.2E+03	1.256	99% Chebyshev	102 of 166
Benzo(g,h,i)perylene	0.251	4.24	0.00989	---	0.545	97.5% Chebyshev	81 of 166
Benzo(k)fluoranthene	0.157	4.25	0.0158	7.8E+04	0.378	97.5% Chebyshev	45 of 166
Beryllium	0.465	4.6	0.014	---	0.668	97.5% Chebyshev	165 of 166
Boron	4.811	54.4	2.43	---	7.387	97.5% Chebyshev	72 of 166
Butyl Benzyl Phthalate	0.0203	0.617	0.0129	1.30E+04	0.0392	95% Chebyshev	10 of 166
Cadmium	0.335	9.71	0.023	---	0.751	97.5% Chebyshev	93 of 166
Carbazole	0.0459	1.54	0.0104	---	0.118	97.5% Chebyshev	42 of 166
Carbon Disulfide	0.0012	0.028	0.000987	5.5E+03	0.004	97.5% Chebyshev	13 of 83
Chromium	13.53	136	2.03	---	17.75	95% Chebyshev	166 of 166
Chrysene	0.327	4.87	0.00901	3.0E+05	0.938	99% Chebyshev	93 of 166
Cobalt	4.144	16	0.049	---	4.407	95% Student's-t	165 of 166
Copper	24.26	487	0.13	---	46.92	97.5% Chebyshev	164 of 166
Cyclohexane	0.266	21.7	0.000626	4.7E+04	1.898	97.5% Chebyshev	47 of 83
Dibenz(a,h)anthracene	0.113	1.64	0.0619	1.0E+03	0.236	97.5% Chebyshev	56 of 166
Dibenzofuran	0.0309	0.821	0.0167	---	0.0709	97.5% Chebyshev	23 of 166
Dieldrin	0.00090075	0.0205	0.000243	1.6E+01	0.0021	97.5% Chebyshev	33 of 166
Di-n-butyl Phthalate	0.0391	0.753	0.0311	1.5E+04	0.0657	95% Chebyshev	11 of 166
Endosulfan Sulfate	0.0013	0.0713	0.0713	---	0.0042	97.5% Chebyshev	21 of 166
Endrin Aldehyde	0.0019	0.0738	0.000497	---	0.0055	97.5% Chebyshev	31 of 166
Endrin Ketone	0.0013	0.02	0.000469	9.7E+02	0.0029	97.5% Chebyshev	25 of 166
Ethylbenzene	0.0038	0.105	0.000654	7.9E+03	0.0127	97.5% Chebyshev	47 of 83
Fluoranthene	0.594	14.2	0.0133	---	1.886	99% Chebyshev	96 of 166
Fluorene	0.0442	1.11	0.00945	---	0.107	97.5% Chebyshev	41 of 166
gamma-Chlordane	0.00069043	0.0156	0.00071	5.0E+02	0.0017	97.5% Chebyshev	12 of 166
Indeno(1,2,3-cd)pyrene	0.368	6.49	0.0574	1.3E+04	0.761	97.5% Chebyshev	104 of 166
Iron	14277	77100	2410	---	17453	95% Chebyshev	166 of 166
Isopropylbenzene (cumene)	0.831	64.9	0.000318	4.8E+03	8.618	99% Chebyshev	16 of 83
Lead	53.52	702	2.48	---	104	97.5% Chebyshev	166 of 166
Lithium	10.03	28.6	0.65	---	12.17	95% Chebyshev	166 of 166
m,p-Xylene	0.0347	2.56	0.000558	4.80E+03	0.227	97.5% Chebyshev	53 of 83
Manganese	261.2	892	59.3	---	277.5	95% Student's-t	166 of 166
Mercury	0.0262	0.85	0.0026	2.4E+00	0.0718	97.5% Chebyshev	73 of 166
Methylcyclohexane	0.0369	2.73	0.000223	2.4E+04	0.242	97.5% Chebyshev	57 of 83
Molybdenum	0.89	10.4	0.088	---	1.61	97.5% Chebyshev	118 of 166
Naphthalene	0.323	19.2	0.00482	1.4E+02	2.775	99% Chebyshev	8 of 83
Nickel	11.74	36.7	2.7	---	12.37	95% Student's-t	166 of 166
n-Propylbenzene	0.0237	1.8	0.00023	3.3E+03	0.159	97.5% Chebyshev	14 of 83
o-Xylene	0.0132	0.84	0.000223	5.80E+03	0.077	97.5% Chebyshev	32 of 83
Phenanthrene	0.401	12.6	0.0136	---	1.349	99% Chebyshev	95 of 166
Pyrene	0.432	8.47	0.0121	---	1.29	99% Chebyshev	98 of 166
Strontium	75.61	591	16.5	---	100.6	95% Chebyshev	166 of 166
Tin	0.616	6.48	0.52	---	0.91	95% Chebyshev	40 of 166
Titanium	25.77	645	4.02	---	32.21	95% Student's-t	166 of 166
Toluene	0.00574	0.0192	0.000721	3.20E+04	0.0137	97.5% Chebyshev	69 of 83
Vanadium	14.4	45.6	4.73	---	15.17	95% Approx. Gamma	166 of 166
Xylene (total)	0.0479	3.4	0.000777	---	0.304	97.5% Chebyshev	53 of 83
Zinc	433.8	7650	6.17	4.8E+03	815.2	97.5% Chebyshev	166 of 166

Notes:

* Soil was collected from 0 to 4 ft. below ground surface.

+ Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - $Air\ Soil_{inh-V}$ PCL = TCEQ protective concentration Level for 30 acre source area Residential soil-to-air pathway (inhalation of volatiles and particulates).

(2) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 25
JOHNSON AND ETINGER VAPOR INTRUSION MODEL OUTPUT FOR
SOUTH AREA GROUNDWATER

Potential Chemical of Concern*	Average	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)	RME EPC ⁽¹⁾	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1,1,1-Trichloroethane	1.85E-04	NA	3.55E-06	1.40E-03	NA	2.68E-05
1,1-Dichloroethane	2.10E-03	NA	6.23E-05	1.50E-02	NA	4.45E-04
2-Butanone	4.30E-04	NA	1.38E-07	3.00E-03	NA	9.59E-07
2-Methylnaphthalene	7.76E-04	NA	2.73E-05	8.80E-03	NA	3.09E-04
4,4'-DDE	3.34E-06	5.18E-11	NA	1.00E-05	1.55E-10	NA
Acetophenone	3.72E-03	NA	5.91E-06	4.60E-02	NA	7.31E-05
Benzene	4.25E-04	2.38E-08	2.38E-04	4.20E-03	2.36E-07	2.35E-03
Benzo(b)fluoranthene	3.26E-04	2.95E-08	NA	2.80E-03	1.36E-07	NA
Carbon Disulfide	6.50E-05	NA	8.94E-06	3.00E-04	NA	4.13E-05
Chrysene	1.93E-04	1.83E-10	NA	6.00E-04	5.69E-10	NA
cis-1,2-Dichloroethene	3.27E-03	NA	1.07E-03	3.00E-02	NA	9.86E-03
Fluorene	1.84E-04	NA	1.56E-06	1.00E-03	NA	8.48E-06
gamma-BHC (Lindane)	7.66E-06	3.61E-10	2.16E-06	4.20E-05	1.98E-09	1.18E-05
Isopropylbenzene (Cumene)	1.78E-04	NA	1.34E-05	1.60E-03	NA	1.21E-04
Vinyl Chloride	1.85E-04	6.15E-08	1.63E-04	1.90E-03	6.31E-07	1.67E-03

Notes:

* Only volatile compounds were assessed for this pathway.

⁽¹⁾ RME EPC is the reasonable maximum exposure point concentration.

TABLE 26
JOHNSON AND ETTINGER VAPOR INTRUSION MODEL OUTPUT FOR
NORTH AREA GROUNDWATER

Potential Chemical of Concern*+	Average	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)	RME EPC ⁽¹⁾	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1,1,1-Trichloroethane	1.48E+01	NA	2.84E-01	1.56E+02	NA	2.99E+00
1,1-Dichloroethane	2.80E+00	NA	8.31E-02	3.15E+01	NA	9.34E-01
1,1-Dichloroethene	3.46E+00	NA	1.26E+00	2.92E+01	NA	1.06E+01
1,2,3-Trichloropropane	6.17E+00	3.83E-03	3.19E+00	4.43E+01	2.75E-02	2.29E+01
1,2,4-Trimethylbenzene	3.80E-02	NA	8.29E-02	4.20E-02	NA	9.16E-02
1,2-Dichloroethane	2.42E+01	1.39E-03	NA	3.28E+02	1.89E-02	NA
1,2-Dichloropropane	4.90E-01	3.46E-05	1.04E+00	3.45E+00	2.43E-04	7.32E+00
2-Methylnaphthalene	2.70E-03	NA	9.49E-05	1.60E-02	NA	5.62E-04
4,4'-DDE	2.14E-05	3.32E-10	NA	2.70E-04	4.19E-09	NA
Acenaphthene	9.00E-04	NA	6.96E-06	8.60E-03	NA	6.65E-05
Acetone	2.81E-01	NA	1.33E-03	1.15E-01	NA	5.45E-04
Acetophenone	6.80E-03	NA	1.08E-05	7.40E-02	NA	1.18E-04
alpha-BHC	1.96E-05	3.66E-09	NA	2.00E-04	3.74E-08	NA
Benzene	1.02E+00	5.72E-05	5.70E-01	8.24E+00	4.62E-04	4.61E+00
Benzo(b)fluoranthene	3.23E-04	2.92E-08	NA	1.40E-03	1.27E-07	NA
Carbon Tetrachloride	5.60E-01	2.63E-04	NA	7.58E+00	3.56E-03	NA
cis-1,2-Dichloroethene	8.96E+00	NA	2.94E+00	1.24E+02	NA	4.08E+01
Dibenzofuran	6.01E-04	NA	1.51E-05	4.90E-03	NA	1.23E-04
Dieldrin	5.01E-06	2.52E-09	7.30E-06	2.64E-05	1.33E-08	3.85E-05
Ethylbenzene	9.69E-02	NA	1.89E-03	7.40E-01	NA	1.44E-02
Fluorene	8.51E-04	NA	7.22E-06	6.10E-03	NA	5.18E-05
gamma-BHC (Lindane)	1.25E-04	5.89E-09	3.53E-05	1.50E-03	7.06E-08	4.23E-04
m,p-Xylene	6.85E-02	NA	1.34E-02	1.68E-01	NA	3.28E-02
Methylene Chloride	9.57E+01	1.77E-04	2.91E-01	1.23E+03	2.27E-03	3.74E+00
Naphthalene	7.83E-02	NA	6.40E-02	3.22E-01	NA	2.63E-01
o-Xylene	4.62E-02	NA	7.26E-03	4.40E-02	NA	6.92E-03
Pyrene	2.23E-04	NA	7.70E-07	5.00E-04	NA	1.73E-06
Styrene	2.60E-02	NA	1.98E-04	2.50E-03	NA	1.91E-05
Tetrachloroethene	1.95E+00	2.05E-04	1.35E-01	2.05E+01	2.15E-03	1.42E+00
Toluene	3.35E-01	NA	1.61E-02	4.05E+00	NA	1.94E-01
Trichloroethene	1.15E+01	1.43E-02	7.59E+00	8.40E+01	1.05E-01	5.54E+01
Vinyl Chloride	5.02E-01	1.67E-04	4.42E-01	5.09E+00	1.69E-03	4.49E+00

Notes:

* Only volatile compounds were assessed for this pathway.

+ Compounds with a cancer risk greater than 1×10^{-5} or a hazard index greater than 1 have been bolded.

⁽¹⁾ RME EPC is the reasonable maximum exposure exposure point concentration.

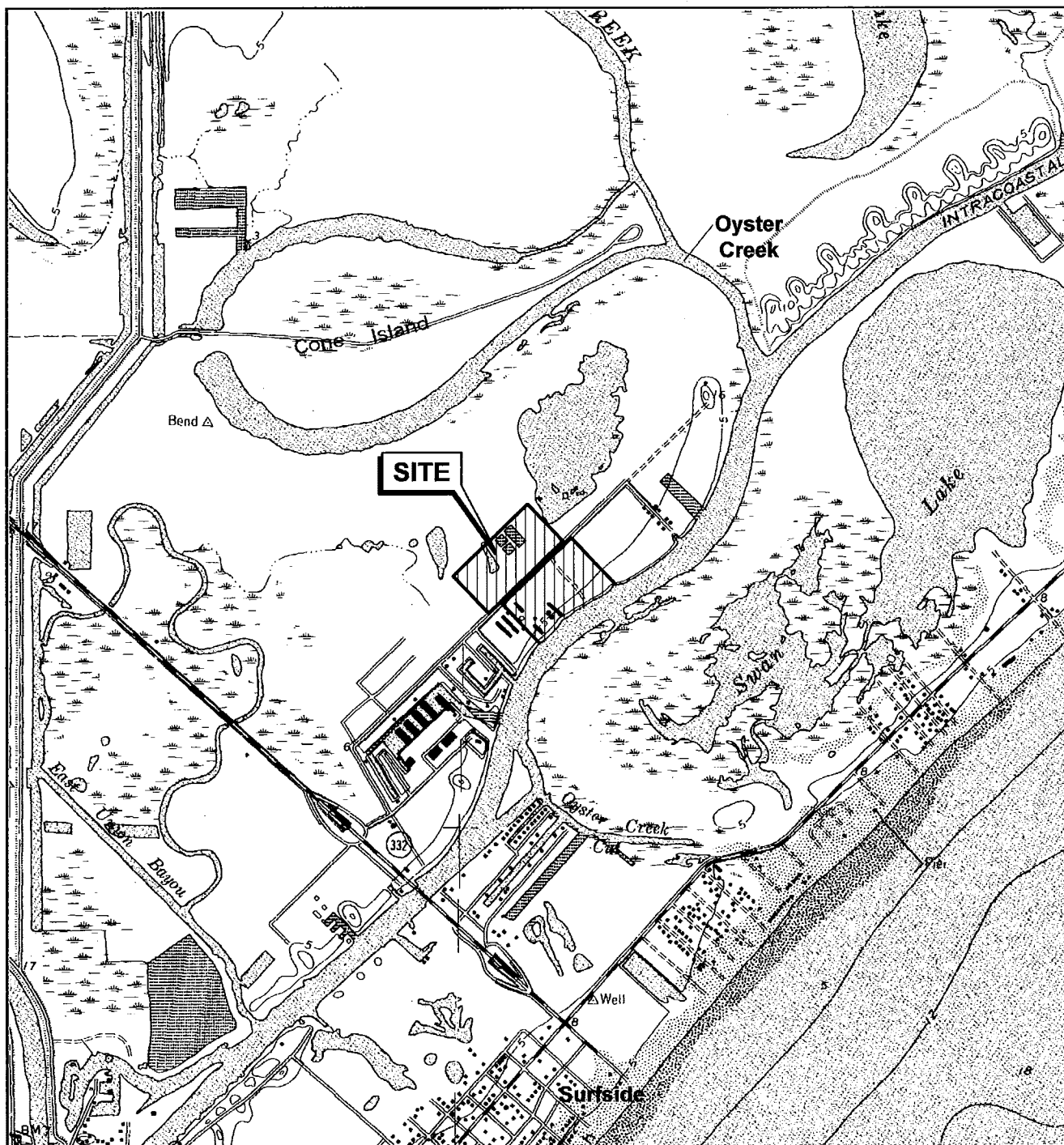
TABLE 27
SUMMARY OF HAZARD INDICES AND CANCER RISK ESTIMATES FOR SOIL EXPOSURE

SOUTH AREA

HYPOTHETICAL ON-SITE RECEPTORS	CARCINOGENIC RISK	NONCARCINOGENIC HAZARD INDEX
Average Youth Trespasser	9.85E-08	1.79E-03
RME Youth Trespasser	1.09E-06	1.46E-02
Average Construction Worker	5.22E-08	2.46E-02
RME Construction Worker	8.19E-07	2.77E-01
Average Industrial Worker	9.50E-07	2.01E-02
RME Industrial Worker	6.08E-06	7.04E-02

NORTH AREA

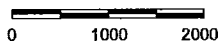
HYPOTHETICAL ON-SITE RECEPTORS	CARCINOGENIC RISK	NONCARCINOGENIC HAZARD INDEX
Average Youth Trespasser	2.57E-08	6.21E-03
RME Youth Trespasser	5.71E-07	2.80E-02
Average Construction Worker	1.37E-08	8.72E-02
RME Construction Worker	4.27E-07	5.45E-01
Average Industrial Worker	2.54E-07	7.34E-02
RME Industrial Worker	3.20E-06	9.28E-02



QUADRANGLE LOCATION



Scale in Feet



GULFCO MARINE MAINTENANCE **FREEPORT, BRAZORIA COUNTY, TEXAS**

Figure 1 **SITE LOCATION MAP**

PROJECT: 1352

BY: ZGK

REVISIONS

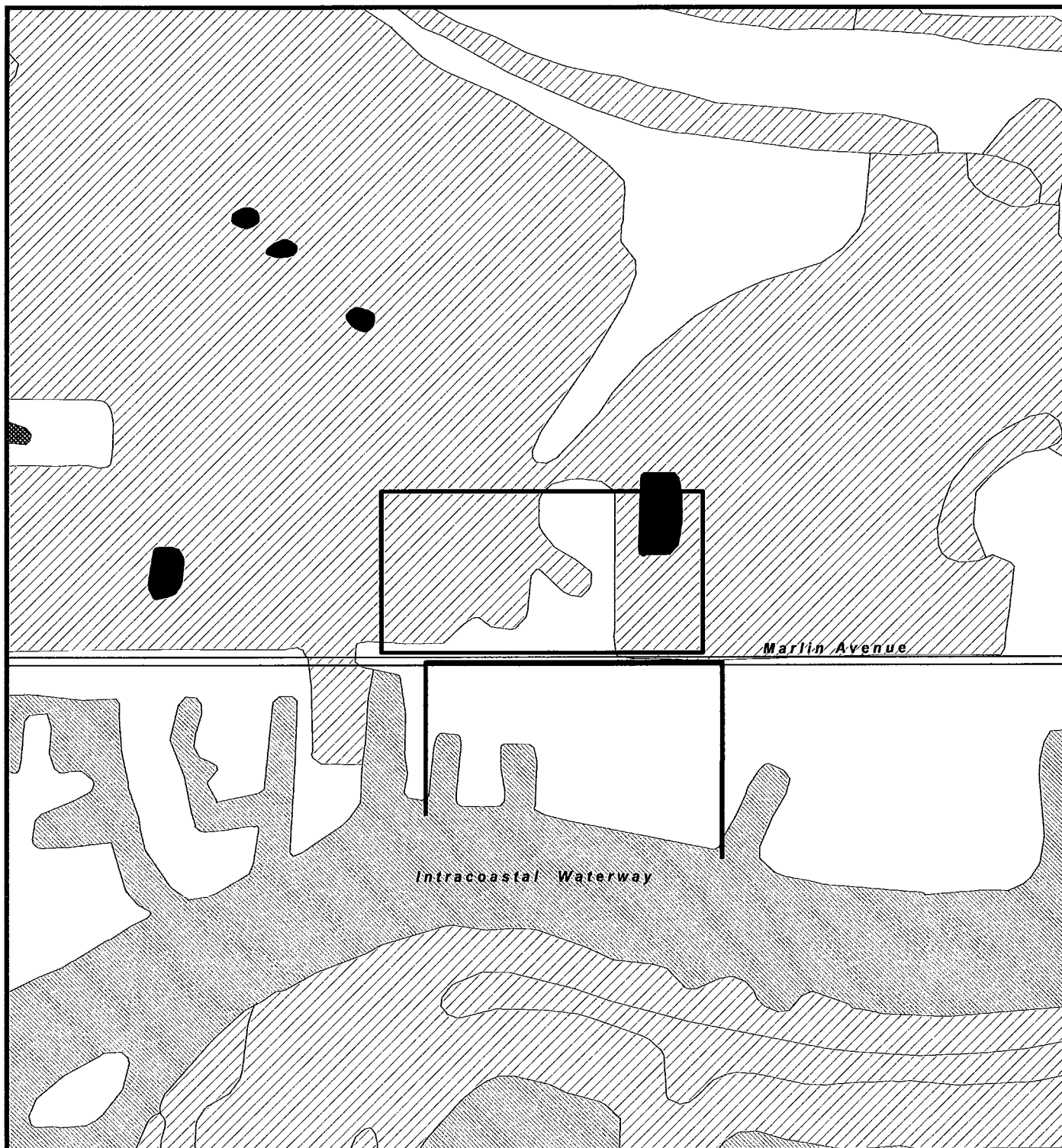
DATE: AUG., 2009

CHECKED: EFP







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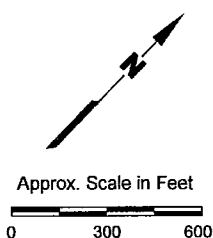
Source:

Base map taken from <http://www.tnris.state.tx.us> Freeport, Texas 7.5 min.
U.S.G.S. quadrangle, 1974.



EXPLANATION

-  Approx. Site Boundary
-  Upland Area
-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Pond



Source:
U.S. Fish & Wildlife Service, Wetlands Online Mapper, 2008.

GULFCO MARINE MAINTENANCE FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 2 **WETLAND MAP**

PROJECT: 1352

BY: ZGK

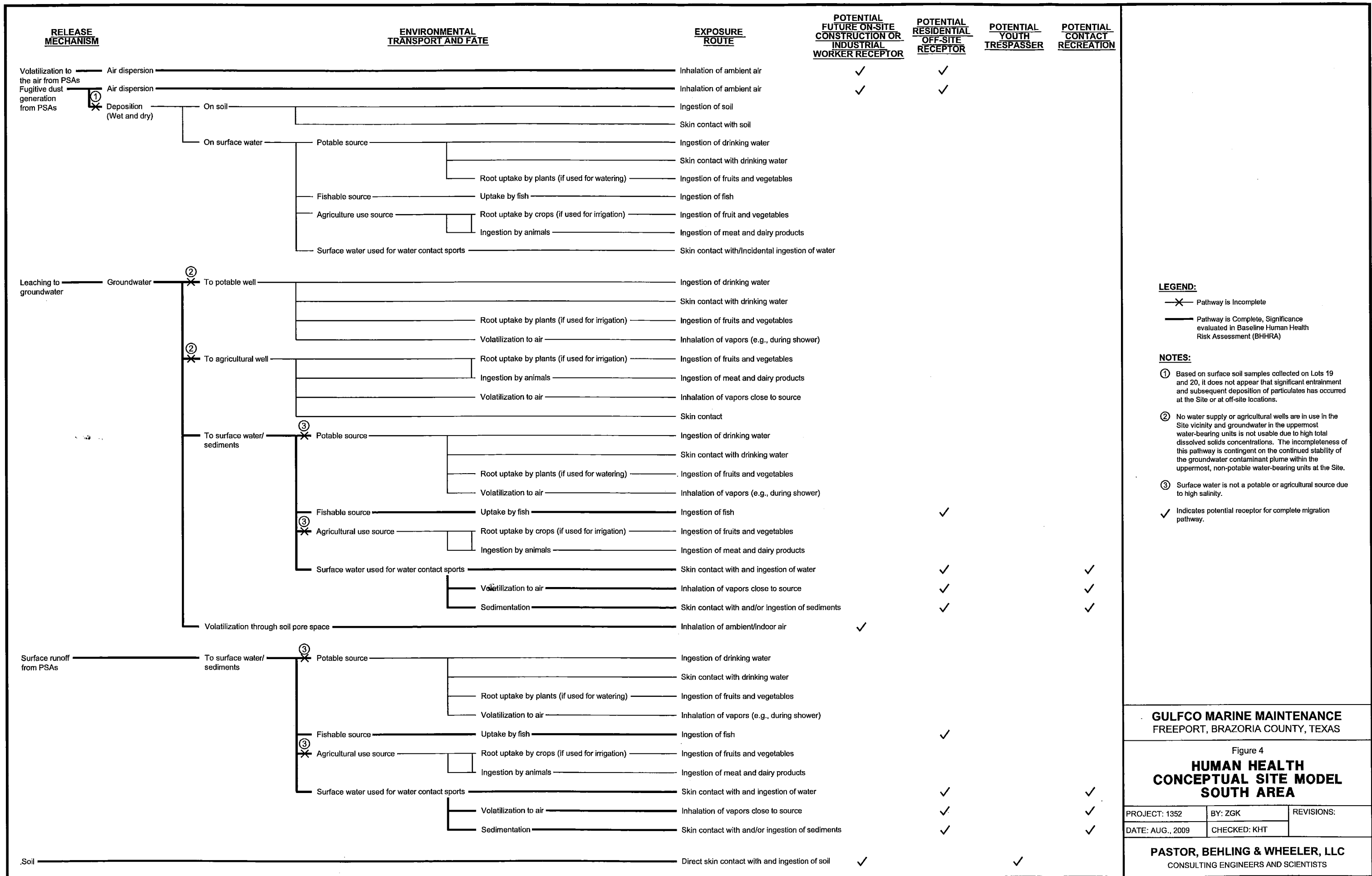
REVISIONS

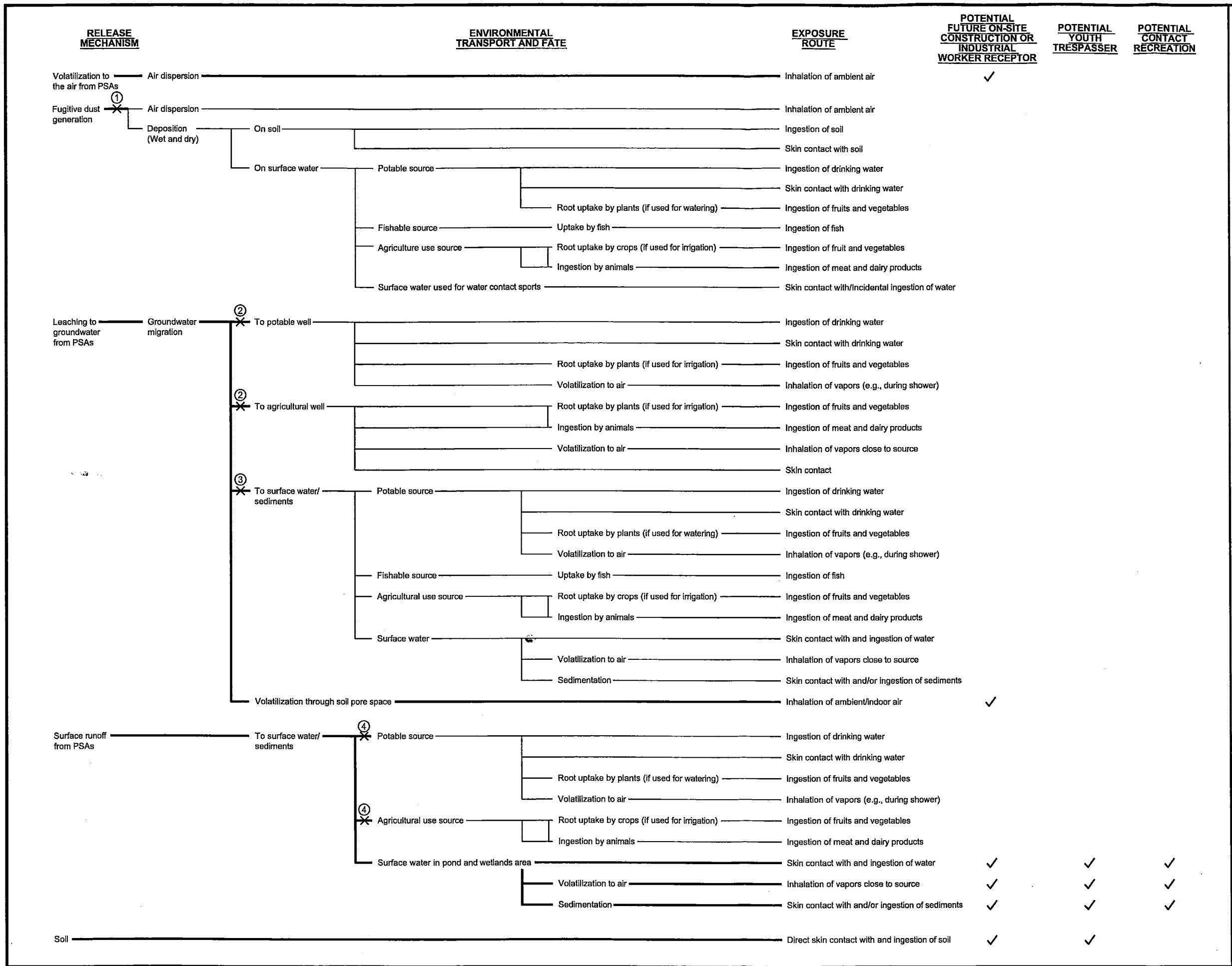
DATE: AUG., 2009

CHECKED: EFP

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LEGEND:

—X— Pathway is Incomplete

— Pathway is Complete, Significance evaluated in Baseline Human Health Risk Assessment (BHRA)

- NOTES:**
- ① The high moisture content and vegetated nature of the limited surface soils in the North Area are not conducive to significant dust generation, dispersion and subsequent deposition.
 - ② No water supply or agricultural wells are in use in the Site vicinity and groundwater in the uppermost water-bearing units is not usable due to high total dissolved solids concentrations. The determination of this pathway as incomplete is contingent on the continued stability of the groundwater contaminant plume within the uppermost, non-potable water-bearing units at the Site.
 - ③ Groundwater communication with North Area surface water features (e.g., ponds, wetlands) is not significant due to water table elevations below the shallow depths of these features and the low permeability of underlying clay soils.
 - ④ Nearby surface water is not used for agricultural use or drinking water.
- ✓ Indicates potential receptor for complete migration pathway.

GULFCO MARINE MAINTENANCE
 FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 5
**HUMAN HEALTH
 CONCEPTUAL SITE MODEL
 NORTH AREA**

PROJECT: 1352	BY: ZGK	REVISIONS:
DATE: AUG., 2009	CHECKED: KHT	

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 CONSULTING ENGINEERS AND SCIENTISTS

TABLE 1
EXPOSURE POINT CONCENTRATION (mg/kg)
SOUTH AREA SURFACE SOIL*

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark ⁽¹⁾	EPA Ecological Screening Level ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
2-Methylnaphthalene	0.0293	0.501	0.0106	---	---	0.0784	97.5% Chebyshev	22 of 83
4,4'-DDD	0.0007894	0.0243	0.00264	---	---	0.0029	97.5% Chebyshev	5 of 83
4,4'-DDE	0.0019	0.0693	0.000428	---	---	0.0074	97.5% Chebyshev	17 of 83
4,4'-DDT	0.0038	0.0625	0.000281	---	0.021 (m)	0.014	99% Chebyshev	37 of 83
Acenaphthene	0.0595	1.69	0.0113	20 (p)	---	0.197	97.5% Chebyshev	26 of 83
Acenaphthylene	0.0382	0.935	0.0184	---	---	0.113	97.5% Chebyshev	19 of 83
Aluminum	5335	15200	414	---	---	5946	95% Student's-t	83 of 83
Anthracene	0.0961	2.46	0.0112	---	---	0.297	97.5% Chebyshev	37 of 83
Antimony	1.118	5.14	0.2	5 (p)	0.27 (m)	1.959	97.5% Chebyshev	72 of 83
Aroclor-1254	0.137	7.98	0.00334	---	---	0.726	97.5% Chebyshev	13 of 85
Arsenic	3.735	24.3	0.26	18 (p)	18 (p)	4.535	95% Approx. Gamma	71 of 83
Barium	345.2	2180	18.6	330 (i)	330 (i)	415.1	95% H-UCL	83 of 83
Benzo(a)anthracene	0.345	5.02	0.0286	---	---	1.211	99% Chebyshev	30 of 83
Benzo(a)pyrene	0.457	4.57	0.0103	---	---	1.457	99% Chebyshev	65 of 83
Benzo(b)fluoranthene	0.582	5.42	0.0408	---	---	1.638	95% H-UCL	61 of 83
Benzo(g,h,i)perylene	0.324	4.24	0.00989	---	---	1.095	99% Chebyshev	51 of 83
Benzo(k)fluoranthene	0.24	4.25	0.0195	---	---	0.651	97.5% Chebyshev	33 of 83
Beryllium	0.408	4.6	0.014	10 (p)	21 (m)	0.487	95% Approx. Gamma	82 of 83
Boron	4.662	54.4	2.43	0.5 (p)	---	9.663	97.5% Chebyshev	34 of 83
Butyl Benzyl Phthalate	0.0187	0.297	0.0129	---	---	0.0373	95% Chebyshev	6 of 83
Cadmium	0.464	9.71	0.023	32 (p)	0.36 (m)	1.71	99% Chebyshev	50 of 83
Carbazole	0.0612	1.54	0.0104	---	---	0.193	97.5% Chebyshev	29 of 83
Chromium	16.08	136	3.37	0.4 (i)	26 (a)	17.45	95% H-UCL	83 of 83
Chrysene	0.409	4.87	0.00932	---	---	1.322	99% Chebyshev	56 of 83
Cobalt	3.705	16	0.049	13 (p)	13 (p)	4.781	95% Chebyshev	82 of 83
Copper	27.98	216	1.55	61 (i)	28 (a)	32.45	95% H-UCL	83 of 83
Dibenz(a,h)anthracene	0.155	1.64	0.0639	---	---	0.363	97.5% Chebyshev	36 of 83
Dibenzofuran	0.0378	0.821	0.0167	---	---	0.111	97.5% Chebyshev	17 of 83
Dieldrin	0.000997	0.0205	0.000243	---	0.0049 (m)	0.003	97.5% Chebyshev	21 of 83
Di-n-butyl Phthalate	0.048	0.753	0.0368	200 (p)	---	0.0967	95% Chebyshev	9 of 83
Endosulfan Sulfate	0.002	0.0713	0.000456	---	---	0.0077	97.5% Chebyshev	17 of 83
Endrin Aldehyde	0.0023	0.0738	0.000497	---	---	0.0084	97.5% Chebyshev	22 of 83
Endrin Ketone	0.0016	0.02	0.000469	---	---	0.004	97.5% Chebyshev	18 of 83
Fluoranthene	0.799	14.2	0.0133	---	---	2.656	95% H-UCL	59 of 83
Fluorene	0.0515	1.11	0.00945	30 (i)	---	0.155	97.5% Chebyshev	28 of 83
gamma-Chlordane	0.00082679	0.0156	0.00071	---	---	0.0025	97.5% Chebyshev	8 of 83
Indeno(1,2,3-cd)pyrene	0.47	6.49	0.0634	---	---	1.115	97.5% Chebyshev	63 of 83
Iron	16285	77100	3450	---	---	17845	95% H-UCL	83 of 83
Lead	69.61	643	2.82	120 (p)	11 (a)	84.5	95% H-UCL	83 of 83
Lithium	7.856	28	0.65	2 (p)	---	9.055	95% Approx. Gamma	83 of 83
Manganese	257.4	892	59.3	500 (p)	220 (p)	281.1	95% Student's-t	83 of 83
Mercury	0.0227	0.66	0.0032	0.1 (i)	---	0.0254	95% H-UCL	37 of 83
Molybdenum	1.306	8.42	0.098	2 (p)	---	1.645	95% Approx. Gamma	71 of 83
Nickel	11.64	36.7	2.84	30 (p)	38 (p)	12.54	95% Approx. Gamma	83 of 83
Phenanthrene	0.512	12.6	0.0139	---	---	2.198	99% Chebyshev	57 of 83
Pyrene	0.533	8.47	0.0121	---	---	1.366	95% H-UCL	57 of 83
Strontium	70.61	527	16.5	---	---	101.2	95% Chebyshev	83 of 83
Tin	0.611	4.95	0.52	50 (p)	---	0.991	95% Chebyshev	23 of 83
Titanium	29.8	645	11.5	---	---	63	95% Chebyshev	83 of 83
Vanadium	13.76	45.6	5.42	2 (p)	7.8 (a)	14.84	95% Approx. Gamma	83 of 83
Zinc	601.2	4770	12.3	120 (i)	46 (a)	727.7	95% Approx. Gamma	83 of 83
LPAH	0.7866	19.296	0.07485	---	29 (i)	3.0384		
HPAH	4.314	59.17	0.27111	---	1.1 (m)	12.874		
Total PAH	5.1006	78.466	0.34596	---	---	15.9124		

Notes:

* Surface soil was collected from 0 to 0.5 ft. below ground surface.

+ Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - From Table 3-4 of TCEQ, 2006.

(2) - From www.epa.gov/ecotox/ecossl.

(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(a) - avian

(i) - soil invertebrate

(m) - mammal

(p) - plant

TABLE 2
EXPOSURE POINT CONCENTRATION (mg/kg)
SOUTH AREA SOIL*

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark ⁽¹⁾	EPA Ecological Screening Level ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
1,3,5-Trimethylbenzene	0.099	4.36	0.000267	---	---	0.532	97.5% Chebyshev	9 of 83
2-Butanone	0.00412	0.0226	0.000992	---	---	0.00925	97.5% Chebyshev	4 of 83
2-Hexanone	0.00406	0.0207	0.00109	---	---	0.0164	97.5% Chebyshev	8 of 83
2-Methylnaphthalene	0.0698	7.21	0.0106	---	---	0.341	97.5% Chebyshev	32 of 166
4,4'-DDD	0.00766	1.12	0.000369	---	---	0.0498	97.5% Chebyshev	21 of 166
4,4'-DDE	0.0017	0.0693	0.000428	---	---	0.0054	97.5% Chebyshev	22 of 166
4,4'-DDT	0.0037	0.113	0.000281	---	0.021 (m)	0.0125	99% Chebyshev	68 of 166
Acenaphthene	0.0419	1.69	0.0113	20 (p)	---	0.115	97.5% Chebyshev	35 of 166
Acenaphthylene	0.042	1.2	0.0172	---	---	0.114	97.5% Chebyshev	37 of 166
Acetone	0.0145	0.16	0.031	---	---	0.0491	99% Chebyshev	10 of 83
Aluminum	6452	15700	414	---	---	6914	95% Student's-t	166 of 166
Anthracene	0.0874	2.46	0.0112	---	---	0.21	97.5% Chebyshev	65 of 166
Antimony	1.023	5.51	0.2	5 (p)	0.27 (m)	1.576	97.5% Chebyshev	144 of 166
Aroclor-1254	0.205	11.5	0.00334	---	---	0.74	97.5% Chebyshev	25 of 170
Arsenic	3.331	24.3	0.23	18 (p)	18 (p)	4.916	97.5% Chebyshev	139 of 166
Barium	237.4	2180	18.6	330 (i)	330 (i)	330.4	95% Chebyshev	166 of 166
Benzene	0.004	0.0221	0.000339	---	---	0.0065	97.5% Chebyshev	72 of 83
Benzo(a)anthracene	0.268	5.02	0.0118	---	---	0.859	99% Chebyshev	44 of 166
Benzo(a)pyrene	0.347	4.88	0.00999	---	---	1.008	99% Chebyshev	113 of 166
Benzo(b)fluoranthene	0.466	5.97	0.0408	---	---	1.256	99% Chebyshev	102 of 166
Benzo(g,h,i)perylene	0.251	4.24	0.00989	---	---	0.545	97.5% Chebyshev	81 of 166
Benzo(k)fluoranthene	0.157	4.25	0.0158	---	---	0.378	97.5% Chebyshev	45 of 166
Beryllium	0.465	4.6	0.014	10 (p)	21 (m)	0.668	97.5% Chebyshev	165 of 166
Boron	4.811	54.4	2.43	0.5 (p)	---	7.387	97.5% Chebyshev	72 of 166
Butyl Benzyl Phthalate	0.0203	0.617	0.0129	---	---	0.0392	95% Chebyshev	10 of 166
Cadmium	0.335	9.71	0.023	32 (p)	0.36 (m)	0.751	97.5% Chebyshev	93 of 166
Carbazole	0.0459	1.54	0.0104	---	---	0.118	97.5% Chebyshev	42 of 166
Carbon Disulfide	0.0012	0.028	0.000987	---	---	0.004	97.5% Chebyshev	13 of 83
Chromium	13.53	136	2.03	0.4 (i)	26 (a)	17.75	95% Chebyshev	166 of 166
Chrysene	0.327	4.87	0.00901	---	---	0.938	99% Chebyshev	93 of 166
Cobalt	4.144	16	0.049	13 (p)	13 (p)	4.407	95% Student's-t	165 of 166
Copper	24.26	487	0.13	61 (i)	28 (a)	46.92	97.5% Chebyshev	164 of 166
Cyclohexane	0.266	21.7	0.000626	---	---	1.898	97.5% Chebyshev	47 of 83
Dibenz(a,h)anthracene	0.113	1.64	0.0619	---	---	0.236	97.5% Chebyshev	56 of 166
Dibenzofuran	0.0309	0.821	0.0167	---	---	0.0709	97.5% Chebyshev	23 of 166
Dieldrin	0.00090075	0.0205	0.000243	---	0.0049 (m)	0.0021	97.5% Chebyshev	33 of 166
Di-n-butyl Phthalate	0.0391	0.753	0.0311	200 (p)	---	0.0657	95% Chebyshev	11 of 166
Endosulfan Sulfate	0.0013	0.0713	0.0713	---	---	0.0042	97.5% Chebyshev	21 of 166
Endrin Aldehyde	0.0019	0.0738	0.000497	---	---	0.0055	97.5% Chebyshev	31 of 166
Endrin Ketone	0.0013	0.02	0.000469	---	---	0.0029	97.5% Chebyshev	25 of 166
Ethylbenzene	0.0038	0.105	0.000654	---	---	0.0127	97.5% Chebyshev	47 of 83
Fluoranthene	0.594	14.2	0.0133	---	---	1.886	99% Chebyshev	96 of 166
Fluorene	0.0442	1.11	0.00945	30 (i)	---	0.107	97.5% Chebyshev	41 of 166
gamma-Chlordane	0.00069043	0.0156	0.00071	---	---	0.0017	97.5% Chebyshev	12 of 166
Indeno(1,2,3-cd)pyrene	0.368	6.49	0.0574	---	---	0.761	97.5% Chebyshev	104 of 166
Iron	14277	77100	2410	---	---	17453	95% Chebyshev	166 of 166
Isopropylbenzene (cumene)	0.831	64.9	0.000318	---	---	8.618	99% Chebyshev	16 of 83
Lead	53.52	702	2.48	120 (p)	11 (a)	104	97.5% Chebyshev	166 of 166
Lithium	10.03	28.6	0.65	2 (p)	---	12.17	95% Chebyshev	166 of 166
m,p-Xylene	0.0347	2.56	0.000558	---	---	0.227	97.5% Chebyshev	53 of 83
Manganese	261.2	892	59.3	500 (p)	220 (p)	277.5	95% Student's-t	166 of 166
Mercury	0.0262	0.85	0.0026	0.1 (i)	---	0.0718	97.5% Chebyshev	73 of 166
Methylcyclohexane	0.0369	2.73	0.000223	---	---	0.242	97.5% Chebyshev	57 of 83
Molybdenum	0.89	10.4	0.088	2 (p)	---	1.61	97.5% Chebyshev	118 of 166
Naphthalene	0.323	19.2	0.00482	---	---	2.775	99% Chebyshev	8 of 83
Nickel	11.74	36.7	2.7	30 (p)	38 (p)	12.37	95% Student's-t	166 of 166
n-Propylbenzene	0.0237	1.8	0.00023	---	---	0.159	97.5% Chebyshev	14 of 83
o-Xylene	0.0132	0.84	0.000223	---	---	0.077	97.5% Chebyshev	32 of 83
Phenanthrene	0.401	12.6	0.0136	---	---	1.349	99% Chebyshev	95 of 166
Pyrene	0.432	8.47	0.0121	---	---	1.29	99% Chebyshev	98 of 166
Strontium	75.61	591	16.5	---	---	100.6	95% Chebyshev	166 of 166
Tin	0.616	6.48	0.52	50 (p)	---	0.91	95% Chebyshev	40 of 166
Titanium	25.77	645	4.02	---	---	32.21	95% Student's-t	166 of 166
Toluene	0.00574	0.0192	0.000721	---	---	0.0137	97.5% Chebyshev	69 of 83
Vanadium	14.4	45.6	4.73	2 (p)	7.8 (a)	15.17	95% Approx. Gamma	166 of 166
Xylene (total)	0.0479	3.4	0.000777	---	---	0.304	97.5% Chebyshev	53 of 83
Zinc	433.8	7650	6.17	120 (i)	46 (a)	815.2	97.5% Chebyshev	166 of 166
HPAH	1.0093	45.47	0.07817	---	29 (i)	5.011		
HPAH	3.323	60.03	0.24199	---	1.1 (m)	9.157		
Total PAH	4.3323	105.5	0.32016	---	---	14.168		

Notes:

* Soil was collected from 0 to 4 ft. below ground surface.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - From Table 3-4 of TCEQ, 2006.

(2) - From www.epa.gov/ecotox/ecossl.

(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(a) - avian

(i) - soil invertebrate

(m) - mammal

(p) - plant

**TABLE 3
EXPOSURE POINT CONCENTRATION (mg/kg)
NORTH AREA SURFACE SOIL***

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark ⁽¹⁾	EPA Ecological Screening Level ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
2-Methylnaphthalene	0.0123	0.053	0.01	---	---	0.0275	95% Chebyshev	3 of 18
4,4'-DDE	0.0011	0.0149	0.00216	---	---	0.0093	99% Chebyshev	2 of 18
4,4'-DDT	0.0012	0.0108	0.000597	---	0.021 (m)	0.0073	99% Chebyshev	7 of 18
Acenaphthene	0.0161	0.157	0.021	20 (p)	---	0.0528	95% Chebyshev	2 of 18
Acenaphthylene	0.0099	0.0555	0.0555	---	---	0.0234	95% Chebyshev	1 of 18
Aluminum	10673	16800	1810	---	---	12185	95% Student's-t	18 of 18
Anthracene	0.0257	0.264	0.00887	---	---	0.168	99% Chebyshev	4 of 18
Antimony	1.744	8.09	1.66	5 (p)	0.27 (m)	6.777	99% Chebyshev	9 of 18
Aroclor-1254	0.0037	0.0122	0.0122	---	---	0.0077	95% Chebyshev	1 of 18
Arsenic	2.522	5.69	0.54	18 (p)	18 (p)	2.999	95% Student's-t	17 of 18
Barium	145.2	476	46.1	330 (i)	330 (i)	264.2	95% Chebyshev	18 of 18
Benzo(a)anthracene	0.0715	1.18	1.18	---	---	0.72	99% Chebyshev	1 of 18
Benzo(a)pyrene	0.114	1.42	0.0135	---	---	0.888	99% Chebyshev	7 of 18
Benzo(b)fluoranthene	0.146	1.62	0.0487	---	---	0.352	95% Adjusted Gamma	8 of 18
Benzo(g,h,i)perylene	0.132	1.28	0.0237	---	---	0.842	99% Chebyshev	10 of 18
Benzo(k)fluoranthene	0.0689	0.799	0.011	---	---	0.505	99% Chebyshev	4 of 18
Beryllium	0.708	2.88	0.066	10 (p)	21 (m)	2.125	99% Chebyshev	17 of 18
Bis(2-ethylhexyl)phthalate	0.0462	0.239	0.0122	---	---	0.0978	95% Chebyshev	6 of 18
Boron	8.028	39.2	3.15	0.5 (p)	---	13.49	95% Approx. Gamma	13 of 18
Butyl Benzyl Phthalate	0.016	0.151	0.151	---	---	0.0514	95% Chebyshev	1 of 18
Cadmium	0.207	0.8	0.28	32 (p)	0.36 (m)	0.799	99% Chebyshev	8 of 18
Carbazole	0.0153	0.128	0.013	---	---	0.045	95% Chebyshev	4 of 18
Chromium	20.26	128	7.9	0.4 (i)	26 (a)	48.59	95% Student's-t	18 of 18
Chrysene	0.102	1.3	0.011	---	---	0.812	99% Chebyshev	7 of 18
Cobalt	5.789	7.87	2.81	13 (p)	13 (p)	6.406	95% Student's-t	18 of 18
Copper	24.13	200	5.9	61 (i)	28 (a)	70.01	95% Chebyshev	18 of 18
Dibenz(a,h)anthracene	0.0471	0.404	0.045	---	---	0.284	99% Chebyshev	4 of 18
Dibenzofuran	0.0129	0.0862	0.0862	---	---	0.0336	95% Chebyshev	1 of 18
Dieldrin	0.0004866	0.00545	0.00545	---	0.0049 (m)	0.0034	99% Chebyshev	1 of 18
Diethyl Phthalate	0.0113	0.011	0.011	100 (p)	---	0.0215	95% Chebyshev	1 of 18
Di-n-butyl Phthalate	0.0179	0.01	0.01	200 (p)	---	0.0357	95% Chebyshev	1 of 18
Di-n-octyl Phthalate	0.0144	0.123	0.0154	---	---	0.0428	95% Chebyshev	2 of 18
Endrin	0.000304	0.00149	0.00149	---	---	0.000759	95% Chebyshev	1 of 18
Endrin Ketone	0.000874	0.00966	0.00966	---	---	0.0031	95% Chebyshev	1 of 18
Fluoranthene	0.159	2.19	0.0214	---	---	1.358	99% Chebyshev	6 of 18
Fluorene	0.0163	0.141	0.017	30 (i)	---	0.0496	95% Chebyshev	3 of 18
Indeno(1,2,3-cd)pyrene	0.151	1.51	0.02	---	---	0.969	99% Chebyshev	9 of 18
Iron	19477	102000	8450	---	---	41127	95% Chebyshev	18 of 18
Lead	57.7	471	8.22	120 (p)	11 (a)	318.3	99% Chebyshev	18 of 18
Lithium	16.57	26.6	2.59	2 (p)	---	18.68	95% Student's-t	18 of 18
Manganese	369.5	1210	82.3	500 (p)	220 (p)	473.3	95% Approx. Gamma	18 of 18
Mercury	0.0126	0.064	0.006	0.1 (i)	---	0.0218	95% Approx. Gamma	8 of 18
Molybdenum	0.949	10.7	0.085	2 (p)	---	6.812	99% Chebyshev	11 of 18
Nickel	17.04	51.7	11.7	30 (p)	38 (p)	20.76	95% Student's-t	18 of 18
Phenanthrene	0.109	1.34	0.018	---	---	0.845	99% Chebyshev	7 of 18
Pyrene	0.147	1.87	0.0149	---	---	1.169	99% Chebyshev	8 of 18
Silver	0.0543	0.41	0.092	2 (p)	---	0.148	95% Chebyshev	2 of 18
Strontium	57.32	93.6	26.6	---	---	65.4	95% Student's-t	18 of 18
Thallium	0.109	0.63	0.63	1 (p)	---	0.273	95% Chebyshev	1 of 18
Tin	0.625	3.67	0.68	50 (p)	---	1.494	95% Chebyshev	4 of 18
Titanium	20.67	55.9	3.41	---	---	26.26	95% Approx. Gamma	18 of 18
Vanadium	19.66	45.8	7.85	2 (p)	7.8 (a)	23.4	95% Student's-t	18 of 18
Zinc	418.4	5640	29.5	120 (i)	46 (a)	3485	99% Chebyshev	18 of 18
LPAH	0.1893	2.0105	0.13037	---	29 (i)	1.1663		
HPAH	1.1385	13.573	1.3892	---	1.1 (m)	7.899		
Total PAH	1.3278	15.5835	1.51957	---	---	9.0653		

Notes:

* Surface soil was collected from 0 to 0.5 ft. below ground surface.

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - From Table 3-4 of TCEQ, 2006.

(2) - From www.epa.gov/ecotox/ecossl.

(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(a) - avian

(i) - soil invertebrate

(m) - mammal

(p) - plant

TABLE 4
EXPOSURE POINT CONCENTRATION (mg/kg)
NORTH AREA SOIL+

Chemicals of Interest**	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark ⁽¹⁾	EPA Ecological Screening Level ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
1,1-Dichloroethane	0.0286	0.518	0.00161	---	---	0.299	99% Chebyshev	3 of 19
1,1-Dichloroethene	0.0179	0.313	0.00178	---	---	0.181	99% Chebyshev	2 of 19
1,2-Dichloroethane	0.0106	0.177	0.00231	---	---	0.103	99% Chebyshev	4 of 19
2-Butanone	0.0029	0.208	0.0017	---	---	0.121	99% Chebyshev	11 of 19
2-Methylnaphthalene	0.0103	0.053	0.01	---	---	0.0198	95% Chebyshev	4 of 36
4,4'-DDE	0.0007	0.0149	0.00216	---	---	0.0024	95% Chebyshev	2 of 36
4,4'-DDT	0.000704	0.0108	0.000597	---	0.021 (m)	0.0038	99% Chebyshev	7 of 36
Acenaphthene	0.0142	0.157	0.021	20 (p)	---	0.036	95% Chebyshev	4 of 36
Aluminum	11971	18300	1810	---	---	13092	95% Student's-t	36 of 36
Anthracene	0.0215	0.264	0.00887	---	---	0.107	99% Chebyshev	6 of 36
Antimony	1.416	8.09	1.66	5 (p)	0.27 (m)	4.366	99% Chebyshev	16 of 36
Aroclor-1254	0.0056	0.0938	0.0122	---	---	0.0168	95% Chebyshev	2 of 36
Arsenic	2.573	5.69	0.54	18 (p)	18 (p)	2.959	95% Student's-t	32 of 36
Barium	142.1	362	46.1	330 (i)	330 (i)	211.7	95% Student's-t	36 of 36
Benzene	0.0027	0.00632	0.00138	---	---	0.0034	95% Student's-t	12 of 19
Benzo(a)anthracene	0.068	1.18	0.0383	---	---	0.464	99% Chebyshev	4 of 36
Benzo(a)pyrene	0.0922	1.42	0.0135	---	---	0.554	99% Chebyshev	10 of 36
Benzo(b)fluoranthene	0.12	1.62	0.0487	---	---	0.649	99% Chebyshev	11 of 36
Benzo(g,h,i)perylene	0.0961	1.28	0.0237	---	---	0.494	99% Chebyshev	14 of 36
Benzo(k)fluoranthene	0.0601	0.799	0.068	---	---	0.341	99% Chebyshev	6 of 36
Beryllium	0.752	2.88	0.066	10 (p)	21 (m)	1.087	95% Chebyshev	35 of 36
Bis(2-ethylhexyl)phthalate	0.0428	0.239	0.0122	---	---	0.0753	95% Chebyshev	11 of 36
Boron	7.576	39.2	3.14	0.5 (p)	---	20.55	99% Chebyshev	26 of 36
Bromoform	0.0023	0.018	0.011	---	---	0.013	99% Chebyshev	2 of 19
Butyl Benzyl Phthalate	0.0125	0.151	0.054	---	---	0.031	95% Chebyshev	2 of 36
Cadmium	0.193	0.8	0.28	32 (p)	0.36 (m)	0.59	99% Chebyshev	15 of 36
Carbazole	0.0143	0.128	0.0108	---	---	0.0323	95% Chebyshev	7 of 36
Carbon Disulfide	0.0028	0.0284	0.00757	---	---	0.018	99% Chebyshev	3 of 19
Chromium	17.17	128	7.76	0.4 (i)	26 (a)	22.69	95% Student's-t	36 of 36
Chrysene	0.0885	1.3	0.0104	---	---	0.529	99% Chebyshev	11 of 36
cis-1,2-Dichloroethene	0.0541	0.999	0.0195	---	---	0.577	99% Chebyshev	2 of 19
Cobalt	6.318	10.3	2.81	13 (p)	13 (p)	6.808	95% Student's-t	36 of 36
Copper	18.7	200	4.59	61 (i)	28 (a)	41.87	95% Student's-t	36 of 36
Cyclohexane	0.0056	0.00185	0.000981	---	---	0.00185	Maximum*	5 of 19
Dibenz(a,h)anthracene	0.0384	0.404	0.045	---	---	0.177	99% Chebyshev	7 of 36
Dibenzofuran	0.0099	0.0862	0.015	---	---	0.0205	95% Chebyshev	2 of 36
Diethyl Phthalate	0.0097	0.011	0.00992	100 (p)	---	0.0118	95% Student's-t	2 of 36
Di-n-butyl Phthalate	0.0155	0.015	0.01	200 (p)	---	0.0248	95% Chebyshev	2 of 36
Di-n-octyl Phthalate	0.0115	0.123	0.0154	---	---	0.0264	95% Chebyshev	3 of 36
Ethylbenzene	0.0016	0.00502	0.00114	---	---	0.00502	Maximum*	5 of 19
Fluoranthene	0.146	2.19	0.0214	---	---	0.923	99% Chebyshev	9 of 36
Fluorene	0.0112	0.141	0.017	30 (i)	---	0.0282	95% Chebyshev	4 of 36
Indeno(1,2,3-cd)pyrene	0.133	1.51	0.02	---	---	0.577	99% Chebyshev	13 of 36
Iron	17531	102000	7120	---	---	21765	95% Student's-t	36 of 36
Lead	37.8	471	5.88	120 (p)	11 (a)	96.63	95% Chebyshev	36 of 36
Lithium	18.84	32.2	2.59	2 (p)	---	20.51	95% Student's-t	36 of 36
m,p-Xylene	0.002	0.00139	0.00132	---	---	0.00139	Maximum*	2 of 19
Manganese	347	1210	82.3	500 (p)	220 (p)	405.2	95% Approx. Gamma	36 of 36
Mercury	0.0094	0.064	0.0034	0.1 (i)	---	0.03	99% Chebyshev	13 of 36
Methylcyclohexane	0.0024	0.00278	0.0015	---	---	0.00278	Maximum*	6 of 19
Molybdenum	0.586	10.7	0.085	2 (p)	---	3.551	99% Chebyshev	21 of 36
Naphthalene	0.0236	0.148	0.0013	---	---	0.102	99% Chebyshev	6 of 19
Nickel	17.17	51.7	9.74	30 (p)	38 (p)	18.79	95% Student's-t	36 of 36
Phenanthrene	0.0998	1.34	0.018	---	---	0.595	99% Chebyshev	10 of 36
Pyrene	0.143	1.97	0.0149	---	---	0.879	99% Chebyshev	11 of 36
Silver	0.0473	0.41	0.092	2 (p)	---	0.103	95% Student's-t	3 of 36
Strontium	56.15	96.2	22.1	---	---	62.05	95% Student's-t	36 of 36
Tetrachloroethene	0.0127	0.223	0.00135	---	---	0.129	99% Chebyshev	3 of 19
Tin	0.47	3.67	0.68	50 (p)	---	0.926	95% Chebyshev	5 of 36
Titanium	20.83	57	3.41	---	---	24.83	95% Student's-t	36 of 36
Toluene	0.0046	0.0122	0.00134	200 (p)	---	0.0122	Maximum*	8 of 19
Vanadium	20.54	45.8	7.85	2 (p)	7.8 (a)	22.9	95% Student's-t	36 of 36
Xylene (total)	0.119	1.76	0.00139	---	---	0.372	95% Adjusted Gamma	8 of 19
Zinc	242.5	5640	21.1	120 (i)	46 (a)	1784	99% Chebyshev	36 of 36
LPAA	0.1806	2.103	0.07617	---	29 (i)	0.888		
HPAA	0.9853	13.673	0.3039	---	1.1 (m)	5.587		
Total PAH	1.1659	15.776	0.38007	---	---	6.475		

Notes:

* Recommended UCL exceeds maximum observation, so the maximum measured concentration was used as the EPC.

+ Soil was collected from 0 to 4 ft. below ground surface.

** Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - From Table 3-4 of TCEQ, 2006.

(2) - From www.epa.gov/ecotox/ecossl.

(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(a) - avian

(i) - soil invertebrate

(m) - mammal

(p) - plant

TABLE 5
EXPOSURE POINT CONCENTRATION (mg/kg)
BACKGROUND SOIL+

Chemicals of Interest**	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark ⁽¹⁾	EPA Ecological Screening Level ⁽²⁾	95% UCL	Statistic Used ⁽³⁾	# of Detects/# of Samples
Antimony	0.953	2.19	0.25	5 (p)	0.27 (m)	2.19	Maximum*	5 of 10
Arsenic	3.438	5.9	0.24	18 (p)	18 (p)	4.477	95% Student's-t	10 of 10
Barium	333.1	1130	150	330 (i)	330 (i)	502.3	95% Approx. Gamma	10 of 10
Benzo(a)anthracene	0.0116	0.082	0.082	---	---	0.0457	95% Chebyshev	1 of 10
Benzo(a)pyrene	0.0122	0.076	0.076	---	---	0.0431	95% Chebyshev	1 of 10
Benzo(b)fluoranthene	0.00941	0.057	0.057	---	---	0.0325	95% Chebyshev	1 of 10
Benzo(g,h,i)perylene	0.0241	0.083	0.083	---	---	0.0527	95% Chebyshev	1 of 10
Benzo(k)fluoranthene	0.0158	0.106	0.106	---	---	0.0595	95% Chebyshev	1 of 10
Cadmium	0.0311	0.11	0.041	32 (p)	0.36 (m)	0.11	Maximum*	3 of 10
Carbazole	0.00512	0.011	0.011	---	---	0.00636	95% Student's-t	1 of 10
Chromium	15.2	20.1	10.7	0.4 (i)	26 (a)	16.95	95% Student's-t	10 of 10
Chrysene	0.0145	0.083	0.083	---	---	0.0477	95% Chebyshev	1 of 10
Copper	12.12	19.3	7.68	61 (i)	28 (a)	14.41	95% Student's-t	10 of 10
Fluoranthene	0.0208	0.156	0.156	---	---	0.156	Maximum*	1 of 10
Indeno(1,2,3-cd)pyrene	0.0551	0.417	0.417	---	---	0.417	Maximum*	1 of 10
Lead	13.43	15.2	11	120 (p)	11 (a)	14.33	95% Student's-t	10 of 10
Lithium	21.14	32.5	14.4	2 (p)	---	24.13	95% Student's-t	10 of 10
Manganese	377.4	551	284	500 (p)	220 (p)	431.8	95% Student's-t	10 of 10
Mercury	0.0213	0.03	0.015	0.1 (i)	---	0.0241	95% Student's-t	10 of 10
Molybdenum	0.522	0.68	0.42	2 (p)	---	0.565	95% Student's-t	10 of 10
Phenanthrene	0.0167	0.137	0.137	---	---	0.137	Maximum*	1 of 10
Pyrene	0.0218	0.127	0.127	---	---	0.0728	95% Chebyshev	1 of 10
Zinc	247	969	36.6	120 (i)	46 (a)	969	Maximum*	10 of 10
LPAH	0.0167	0.137	0.137	---	29 (i)	0.137		
HPAH	0.18531	1.187	1.187	---	1.1 (m)	0.927		
Total PAH	0.20201	1.324	1.324	---	---	1.064		

Notes:

* Recommended UCL exceeds maximum observation, so the maximum measured concentration was used as the EPC.

+ Soil was collected from 0 to 4 ft. below ground surface.

** Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-4 of TCEQ, 2006.

(2) - From www.epa.gov/ecotox/ecossl.

(3) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(a) - avian

(i) - soil invertebrate

(m) - mammal

(p) - plant

TABLE 6
EXPOSURE POINT CONCENTRATION (mg/kg)
INTRACOASTAL WATERWAY SEDIMENT

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL ⁽¹⁾	TCEQ Second Effects Level for Sediment ⁽²⁾	Average of TCEQ PCL and SEL ⁽³⁾	EPA EcoTox Threshold ⁽⁴⁾	95% UCL	Statistic Used ⁽⁵⁾	# of Detects/# of Samples
1,2-Dichloroethane	4.10E-04	3.02E-03	3.02E-03	4.30E+00	2.58E+01	1.51E+01	---	1.10E-03	95% Chebyshev	1 of 16
1,2-Diphenylhydrazine/azobenzene	7.30E-03	3.17E-02	3.17E-02	---	---	---	---	1.03E-02	95% Student's-t	1 of 16
2-Methylnaphthalene	8.30E-03	1.88E-02	1.88E-02	7.00E-02	6.70E-01	3.70E-01	---	9.60E-03	95% Student's-t	1 of 16
3,3'-Dichlorobenzidine	4.08E-02	1.51E-01	1.51E-01	---	---	---	---	5.38E-02	95% Student's-t	1 of 16
4,4'-DDT	4.11E-04	3.32E-03	4.81E-04	1.19E-03	6.29E-02	3.20E-02	1.60E-03	2.30E-03	99% Chebyshev	4 of 17
4,6-Dinitro-2-methylphenol	1.70E-02	6.27E-02	6.27E-02	---	---	---	---	2.24E-02	95% Student's-t	1 of 16
Acenaphthylene	1.16E-02	6.31E-02	2.39E-02	1.60E-02	5.00E-01	2.58E-01	1.10E+00	2.73E-02	95% Chebyshev	2 of 16
Aluminum	6.85E+03	1.25E+04	3.90E+03	---	---	---	---	7.88E+03	95% Student's-t	16 of 16
Anthracene	2.01E-02	7.53E-02	2.36E-02	8.53E-02	1.10E+00	5.93E-01	---	4.24E-02	95% Chebyshev	6 of 16
Antimony	2.25E+00	8.14E+00	7.40E-01	---	---	---	---	2.99E+00	95% Approx. Gamma	16 of 16
Arsenic	4.03E+00	7.62E+00	2.41E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	4.64E+00	95% Student's-t	16 of 16
Atrazine (Aatrex)	1.79E-02	8.14E-02	8.14E-02	---	---	---	---	2.54E-02	95% Student's-t	1 of 16
Barium	2.15E+02	3.77E+02	1.16E+02	---	---	---	---	2.43E+02	95% Approx. Gamma	16 of 16
Benzo(a)anthracene	4.54E-02	3.95E-01	6.75E-02	2.61E-01	1.60E+00	9.31E-01	---	3.01E-01	99% Chebyshev	3 of 16
Benzo(a)pyrene	6.61E-02	4.45E-01	5.25E-02	4.30E-01	1.60E+00	1.02E+00	4.30E-01	3.52E-01	99% Chebyshev	6 of 16
Benzo(b)fluoranthene	1.00E-01	6.11E-01	3.24E-02	---	---	---	---	4.91E-01	99% Chebyshev	9 of 16
Benzo(g,h,i)perylene	6.61E-02	4.42E-01	1.73E-02	---	---	---	---	3.57E-01	99% Chebyshev	7 of 16
Benzo(k)fluoranthene	5.89E-02	3.18E-01	4.74E-02	---	---	---	---	2.71E-01	99% Chebyshev	6 of 16
Beryllium	4.63E-01	8.20E-01	2.90E-01	---	---	---	---	5.28E-01	95% Student's-t	16 of 16
Boron	1.20E+01	2.72E+01	1.25E+01	---	---	---	---	2.72E+01	Maximum*	10 of 16
Butyl Benzyl Phthalate	2.08E-02	2.02E-01	2.02E-01	---	---	---	1.10E+01	7.35E-02	95% Chebyshev	1 of 16
Carbazole	1.51E-02	8.61E-02	1.95E-02	---	---	---	---	3.84E-02	95% Chebyshev	3 of 16
Chloroform	9.02E-04	5.27E-03	5.04E-03	4.30E+00	2.58E+01	1.51E+01	---	5.00E-03	99% Chebyshev	2 of 16
Chromium	9.21E+00	1.44E+01	5.01E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	1.04E+01	95% Student's-t	16 of 16
Chrysene	7.74E-02	4.75E-01	1.37E-02	3.84E-01	2.80E+00	1.59E+00	---	1.53E-01	95% Approx. Gamma	10 of 16
Cobalt	4.39E+00	7.18E+00	3.05E+00	---	---	---	---	4.88E+00	95% Student's-t	16 of 16
Copper	7.11E+00	1.26E+01	3.28E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	8.43E+00	95% Student's-t	16 of 16
Cyclohexane	2.30E-03	1.92E-03	1.92E-03	---	---	---	---	2.90E-03	95% Approx. Gamma	1 of 16
Dibenz(a,h)anthracene	4.35E-02	2.35E-01	5.11E-02	6.34E-02	2.60E-01	1.62E-01	---	2.05E-01	99% Chebyshev	6 of 16
Dibenzofuran	1.23E-02	3.05E-02	2.68E-02	---	---	---	2.00E+00	1.52E-02	95% Student's-t	2 of 16
Diethyl Phthalate	1.35E-02	3.89E-02	3.89E-02	---	---	---	6.30E-01	1.66E-02	95% Student's-t	1 of 16
Di-n-octyl Phthalate	1.80E-02	1.92E-01	1.47E-02	---	---	---	---	6.86E-02	95% Chebyshev	2 of 16
Fluoranthene	1.13E-01	8.04E-01	2.22E-02	6.00E-01	5.10E+00	2.85E+00	1.40E+00	6.14E-01	99% Chebyshev	8 of 16
Fluorene	1.22E-02	4.60E-02	1.24E-02	1.90E-02	5.40E-01	2.80E-01	5.40E-01	2.43E-02	95% Chebyshev	4 of 16
gamma-Chlordane	3.13E-04	8.26E-04	6.38E-04	2.26E-03	4.79E-03	3.53E-03	---	5.70E-04	95% Chebyshev	4 of 16
Hexachlorobenzene	1.00E-02	3.19E-02	3.19E-02	---	---	---	---	1.26E-02	95% Student's-t	1 of 16
Indeno(1,2,3-cd)pyrene	7.22E-02	4.05E-01	5.56E-02	---	---	---	---	3.47E-01	99% Chebyshev	6 of 16
Iron	1.34E+04	2.82E+04	6.75E+03	---	---	---	---	1.60E+04	95% Approx. Gamma	16 of 16
Lead	1.16E+01	3.23E+01	5.00E+00	4.67E+01	2.18E+02	1.32E+02	4.70E+01	1.48E+01	95% Approx. Gamma	16 of 16
Isopropylbenzene (cumene)	1.00E-03	7.04E-03	4.64E-03	---	---	---	---	5.80E-03	99% Chebyshev	2 of 16
Lithium	1.05E+01	2.00E+01	6.40E+00	---	---	---	---	1.21E+01	95% Student's-t	16 of 16
Manganese	2.83E+02	4.74E+02	1.92E+02	---	---	---	---	3.22E+02	95% Student's-t	16 of 16
Mercury	2.01E-02	3.60E-02	1.10E-02	1.50E-01	7.10E-01	4.30E-01	1.50E-01	2.33E-02	95% Student's-t	16 of 16
Methylcyclohexane	9.51E-04	3.70E-03	3.70E-03	---	---	---	---	1.30E-03	95% Approx. Gamma	1 of 16
Molybdenum	6.67E-01	5.66E+00	1.40E-01	---	---	---	---	2.15E+00	95% Chebyshev	16 of 16
Nickel	9.59E+00	1.67E+01	5.80E+00	2.09E+01	5.16E+01	3.63E+01	2.10E+01	1.08E+01	95% Student's-t	16 of 16
n-Nitrosodiphenylamine	1.02E-02	4.34E-02	4.34E-02	---	---	---	---	1.41E-02	95% Student's-t	1 of 16
Phenanthrene	7.46E-02	5.08E-01	3.11E-02	2.40E-01	1.50E+00	8.70E-01	1.10E+00	3.88E-01	99% Chebyshev	8 of 16
Pyrene	1.30E-01	8.62E-01	1.76E-02	6.65E-01	2.60E+00	1.63E+00	6.60E-01	6.78E-01	99% Chebyshev	10 of 16
Silver	1.72E-01	5.40E-01	3.00E-01	---	---	---	---	3.76E-01	Maximum*	6 of 16
Strontium	4.49E+01	8.17E+01	3.28E+01	---	---	---	---	5.12E+01	95% Student's-t	16 of 16
Titanium	2.56E+01	3.66E+01	1.91E+01	---	---	---	---	2.78E+01	95% Student's-t	16 of 16
Toluene	1.40E-03	5.81E-03	5.81E-03	9.40E-01	5.66E+00	3.30E+00	6.70E-01	2.00E-03	95% Approx. Gamma	1 of 16
Vanadium	1.39E+01	2.12E+01	9.06E+00	---	---	---	---	1.54E+01	95% Student's-t	16 of 16
Zinc	4.54E+01	9.26E+01	1.80E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	5.41E+01	95% Student's-t	16 of 16
LPAH	1.27E-01	7.11E-01	1.10E-01	5.52E-01	3.16E+00	1.86E+00	---	4.92E-01	---	---
HPAH	7.73E-01	4.99E+00	3.77E-01	1.70E+00	9.60E+00	5.65E+00	---	3.77E+00	---	---
Total PAHs	8.99E-01	5.70E+00	4.87E-01	4.02E+00	4.48E+01	2.44E+01	4.00E+00	4.26E+00	---	---

Notes:

* Recommended UCL exceeds maximum observation so the maximum measured concentration was used as the EPC.

* Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 7
EXPOSURE POINT CONCENTRATION (mg/kg)
INTRACOASTAL WATERWAY BACKGROUND SEDIMENT

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL ⁽¹⁾	TCEQ Second Effects Level for Sediment ⁽²⁾	Average of TCEQ PCL and SEL ⁽³⁾	EPA EcoTox Threshold ⁽⁴⁾	95% UCL	Statistic Used ⁽⁵⁾	# of Detects/# of Samples
1,2,4-Trimethylbenzene	9.10E-04	3.91E-03	3.91E-03	2.16E+00	1.30E+01	7.56E+00	---	2.00E-03	95% Approx. Gamma	1 of 9
1,4-Dichlorobenzene	1.40E-03	4.11E-03	4.11E-03	7.00E-01	4.21E+00	2.46E+00	3.50E-01	2.80E-03	95% Approx. Gamma	1 of 9
2-Butanone	1.10E-03	2.16E-03	2.00E-03	---	---	---	---	1.70E-03	95% Student's-t	2 of 9
4,4'-DDT	1.56E-04	5.70E-04	5.70E-04	1.19E-03	6.29E-02	3.20E-02	1.60E-03	3.82E-04	95% Chebyshev	1 of 9
Aluminum	1.22E+04	2.18E+04	4.73E+03	---	---	---	---	1.65E+04	95% Student's-t	9 of 9
Antimony	4.02E+00	7.33E+00	1.68E+00	---	---	---	---	5.40E+00	95% Student's-t	9 of 9
Arsenic	5.81E+00	9.62E+00	2.36E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	7.74E+00	95% Student's-t	9 of 9
Barium	209.7.2	2.80E+02	1.11E+02	---	---	---	---	2.39E+02	95% Student's-t	9 of 9
Benzo(b)fluoranthene	8.70E-03	3.69E-02	3.69E-02	---	---	---	---	2.41E-02	95% Chebyshev	1 of 9
Beryllium	7.66E-01	1.32E+00	3.20E-01	---	---	---	---	1.02E+00	95% Student's-t	9 of 9
Boron	2.76E+01	4.79E+01	1.33E+01	---	---	---	---	3.56E+01	95% Student's-t	9 of 9
Carbon Disulfide	1.50E-03	8.41E-03	3.41E-03	---	---	---	---	4.80E-03	95% Approx. Gamma	2 of 9
Chromium	1.28E+01	2.25E+01	5.81E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	1.69E+01	95% Student's-t	9 of 9
cis-1,2-Dichloroethene	3.40E-03	2.84E-02	2.84E-02	---	---	---	---	3.45E-02	99% Chebyshev	1 of 9
Cobalt	6.70E+00	1.18E+01	3.32E+00	---	---	---	---	8.66E+00	95% Student's-t	9 of 9
Copper	8.14E+00	1.68E+01	2.68E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	1.13E+01	95% Student's-t	9 of 9
Iron	1.65E+04	2.79E+04	7.44E+03	---	---	---	---	2.15E+04	95% Student's-t	9 of 9
Lead	9.59E+00	1.45E+01	5.34E+00	4.67E+01	2.18E+02	1.32E+02	4.70E+01	1.18E+01	95% Student's-t	9 of 9
Lithium	2.14E+01	4.46E+01	7.29E+00	---	---	---	---	3.03E+01	95% Student's-t	9 of 9
Manganese	3.31E+02	4.42E+02	2.12E+02	---	---	---	---	3.86E+02	95% Student's-t	9 of 9
Mercury	1.76E-02	5.00E-02	6.50E-03	1.50E-01	7.10E-01	4.30E-01	1.50E-01	2.73E-02	95% Approx. Gamma	9 of 9
Molybdenum	2.41E-01	3.50E-01	1.60E-01	---	---	---	---	2.83E-01	95% Student's-t	9 of 9
Nickel	1.49E+01	2.73E+01	6.31E+00	2.09E+01	5.16E+01	3.63E+01	2.10E+01	1.99E+01	95% Student's-t	9 of 9
Strontium	5.92E+01	8.74E+01	3.48E+01	---	---	---	---	7.28E+01	95% Student's-t	9 of 9
Titanium	3.18E+01	5.45E+01	2.11E+01	---	---	---	---	3.83E+01	95% Student's-t	9 of 9
Trichloroethene	2.10E-03	1.59E-02	1.59E-02	1.47E+00	8.82E+00	5.15E+00	1.60E+00	4.30E-03	99% Chebyshev	1 of 9
Vanadium	2.02E+01	3.42E+01	1.02E+01	---	---	---	---	2.59E+01	95% Student's-t	9 of 9
Xylene	1.70E-03	3.35E-03	3.35E-03	---	---	---	---	2.60E-03	95% Student's-t	1 of 9
Zinc	3.60E+01	5.41E+01	1.93E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	4.45E+01	95% Student's-t	9 of 9
LPAH ⁺⁺				5.52E-01	3.16E+00	1.86E+00	---			
HPAH	8.70E-03	3.69E-02	3.69E-02	1.70E+00	9.60E+00	5.65E+00	---	2.41E-02		
Total PAHs	8.70E-03	3.69E-02	3.69E-02	4.02E+00	4.48E+01	2.44E+01	---	2.41E-02		

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

⁺⁺ No LPAHs were detected in the samples.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 8
EXPOSURE POINT CONCENTRATION (mg/kg)
WETLAND SEDIMENT

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL ⁽¹⁾	TCEQ Second Effects Level for Sediment ⁽²⁾	Average of TCEQ PCL and SEL ⁽³⁾	EPA EcoTox Threshold ⁽⁴⁾	95% UCL	Statistic Used ⁽⁵⁾	# of Detects/# of Samples
1,2-Dichloroethane	2.49E-04	2.40E-03	1.83E-03	4.30E+00	2.58E+01	1.51E+01	---	5.90E-04	95% Chebyshev	3 of 48
2-Methylnaphthalene	2.46E-02	4.30E-01	1.22E-02	7.00E-02	6.70E-01	3.70E-01	---	1.16E-01	99% Chebyshev	4 of 48
4,4'-DDT	9.52E-04	9.22E-03	9.29E-04	1.19E-03	6.29E-02	3.20E-02	1.60E-03	2.20E-03	97.5% Chebyshev	16 of 55
Acenaphthene	1.95E-02	1.33E-01	1.60E-02	1.60E-02	5.00E-01	2.58E-01	1.10E+00	6.40E-02	99% Chebyshev	4 of 48
Acenaphthylene	3.14E-02	5.45E-01	2.91E-02	4.40E-02	6.40E-01	3.42E-01	---	1.65E-01	99% Chebyshev	4 of 48
Aluminum	1.32E+04	1.82E+04	3.40E+03	---	---	---	---	1.40E+04	95% Student's-t	48 of 48
Anthracene	2.88E-02	3.34E-01	8.38E-03	8.53E-02	1.10E+00	5.93E-01	---	1.26E-01	99% Chebyshev	8 of 48
Antimony ⁽⁶⁾	1.15E+00	4.24E+00	4.60E-01	---	---	---	---	1.61E+00	95% Chebyshev	40 of 48
Arsenic	2.53E+00	1.28E+01	1.00E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	3.40E+00	95% Approx. Gamma	35 of 48
Barium	1.52E+02	8.20E+02	3.60E+01	---	---	---	---	2.38E+02	95% Chebyshev	48 of 48
Benzo(a)anthracene	5.43E-02	9.93E-01	5.46E-02	2.61E-01	1.60E+00	9.31E-01	---	3.06E-01	99% Chebyshev	5 of 48
Benzo(a)pyrene	1.04E-01	1.30E+00	1.76E-02	4.30E-01	1.60E+00	1.02E+00	4.30E-01	4.76E-01	99% Chebyshev	15 of 48
Benzo(b)fluoranthene	9.02E-02	1.36E+00	1.62E-02	---	---	---	---	4.31E-01	99% Chebyshev	19 of 48
Benzo(g,h,i)perylene	1.98E-01	1.94E+00	4.40E-02	---	---	---	---	7.55E-01	99% Chebyshev	24 of 48
Benzo(k)fluoranthene	6.59E-02	7.30E-01	6.92E-02	---	---	---	---	2.37E-01	99% Chebyshev	14 of 48
Beryllium	8.94E-01	1.37E+00	2.80E-01	---	---	---	---	9.43E-01	95% Student's-t	48 of 48
Boron ⁽⁶⁾	1.45E+01	4.62E+01	5.17E+00	---	---	---	---	3.20E+01	99% Chebyshev	24 of 48
Cadmium	1.03E-01	4.80E-01	3.30E-02	1.20E+00	9.60E+00	5.40E+00	1.20E+00	3.13E-01	99% Chebyshev	20 of 48
Carbazole	1.92E-02	1.41E-01	1.58E-02	---	---	---	---	6.45E-02	99% Chebyshev	5 of 48
Carbon Disulfide	5.25E-04	6.99E-03	3.34E-03	---	---	---	---	2.60E-03	99% Chebyshev	4 of 48
Chromium	1.51E+01	4.46E+01	8.96E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	1.64E+01	95% Student's-t	48 of 48
Chromium VI	9.56E-01	4.04E+00	1.30E+00	---	---	---	---	3.36E+00	99% Chebyshev	6 of 25
Chrysene	2.17E-01	4.05E+00	1.10E-02	3.84E-01	2.80E+00	1.59E+00	---	1.24E+00	99% Chebyshev	19 of 48
Cobalt	6.98E+00	9.89E+00	3.00E+00	---	---	---	---	7.32E+00	95% Student's-t	48 of 48
Copper	1.45E+01	4.90E+01	5.44E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	1.66E+01	95% Student's-t	48 of 48
Dibenz(a,h)anthracene	2.03E-01	2.91E+00	1.29E-01	6.34E-02	2.60E-01	1.62E-01	---	1.10E+00	99% Chebyshev	6 of 48
Dibenzofuran	1.39E-02	8.00E-02	1.00E-02	---	---	---	2.00E+00	2.50E-02	95% Chebyshev	3 of 48
Endosulfan Sulfate	1.80E-03	6.00E-02	7.31E-03	---	---	---	5.40E-03	1.44E-02	99% Chebyshev	3 of 48
Endrin Aldehyde	1.00E-03	1.00E-02	5.66E-04	---	---	---	---	4.30E-03	99% Chebyshev	9 of 48
Endrin Ketone	7.85E-04	1.30E-02	3.29E-03	---	---	---	---	2.00E-03	95% Chebyshev	3 of 48
Fluoranthene	1.08E-01	2.17E+00	1.20E-02	6.00E-01	5.10E+00	2.85E+00	1.40E+00	6.37E-01	99% Chebyshev	13 of 48
Fluorene	1.86E-02	1.39E-01	1.50E-02	1.90E-02	5.40E-01	2.80E-01	5.40E-01	6.37E-02	99% Chebyshev	4 of 48
gamma-Chlordane	4.05E-04	3.60E-03	7.69E-04	2.26E-03	4.79E-03	3.53E-03	---	8.27E-04	95% Chebyshev	4 of 48
Indeno(1,2,3-cd)pyrene	2.01E-01	1.94E+00	6.28E-02	---	---	---	---	7.85E-01	99% Chebyshev	23 of 48
Iron	1.72E+04	6.09E+04	1.11E+04	---	---	---	---	1.88E+04	95% Student's-t	49 of 48
Lead	2.54E+01	2.37E+02	9.40E+00	4.67E+01	2.18E+02	1.32E+02	4.70E+01	4.68E+01	95% Chebyshev	48 of 48
Lithium	1.87E+01	2.76E+01	5.43E+00	---	---	---	---	1.96E+01	95% Student's-t	48 of 48
Manganese	3.32E+02	1.01E+03	8.76E+01	---	---	---	---	3.83E+02	95% Approx. Gamma	48 of 48
Mercury	1.99E-02	8.10E-02	6.10E-03	1.50E-01	7.10E-01	4.30E-01	1.50E-01	2.68E-02	95% H-UCL	26 of 48
Molybdenum	5.81E-01	3.24E+00	1.30E-01	---	---	---	---	7.63E-01	95% Approx. Gamma	38 of 48
Nickel	1.73E+01	2.77E+01	1.09E+01	2.09E+01	5.16E+01	3.63E+01	2.10E+01	1.81E+01	95% Student's-t	48 of 48
Phenanthrene	7.61E-02	1.30E+00	2.30E-02	2.40E-01	1.50E+00	8.70E-01	1.10E+00	4.32E-01	99% Chebyshev	12 of 48
Pyrene	1.54E-01	1.64E+00	1.59E-02	6.65E-01	2.60E+00	1.63E+00	6.60E-01	6.63E-01	99% Chebyshev	19 of 48
Strontium	6.70E+01	3.30E+02	1.88E+01	---	---	---	---	7.64E+01	95% H-UCL	48 of 48
Tin ⁽⁶⁾	6.38E-01	4.61E+00	3.45E+00	---	---	---	---	1.26E+00	95% Chebyshev	4 of 48
Titanium	2.91E+01	6.87E+01	8.15E+00	---	---	---	---	3.27E+01	95% Approx. Gamma	48 of 48
Toluene	6.55E-04	2.14E-03	1.57E-03	9.40E-01	5.66E+00	3.30E+00	6.70E-01	1.20E-03	95% Chebyshev	3 of 48
Vanadium	2.17E+01	3.20E+01	9.02E+00	---	---	---	---	2.28E+01	95% Student's-t	48 of 48
Zinc	1.39E+02	9.03E+02	3.15E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	2.36E+02	95% Chebyshev	53 of 53
LPAH	1.99E-01	2.88E+00	1.04E-01	5.52E-01	3.16E+00	1.86E+00	---	9.67E-01	---	---
HPAH	1.40E+00	1.90E+01	4.32E-01	1.70E+00	9.60E+00	5.65E+00	---	6.63E+00	---	---
TOTAL PAHs	1.59E+00	2.19E+01	5.36E-01	4.02E+00	4.48E+01	1.18E+01	4.00E+00	7.60E+00	---	---

Notes:

* Chemicals of interest are any chemical measured in at least one sample at a frequency of detection greater than five percent.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

(6) - Samples 2WSED8, SWSED10, 4WSED2, and 4WSED3 were re-analyzed for antimony, boron, and tin because they were measured at concentrations much higher than the rest of the data although QA/QC indicated that they were acceptable. The re-analysis was run twice with good concurrence between the two re-analyses but with very different values from the original so the first re-analyzed value was used in the UCL calculation.

TABLE 9
EXPOSURE POINT CONCENTRATION (mg/kg)
POND SEDIMENT

Chemicals of Interest*	Average	Max Detection	Min Detection	TCEQ Marine Sediment PCL ⁽¹⁾	TCEQ Second Effects Level for Sediment ⁽²⁾	Average of TCEQ PCL and SEL ⁽³⁾	EPA EcoTox Threshold ⁽⁴⁾	RME EPC	Statistic Used ⁽⁵⁾	# of Detects/# of Samples
2,4,6-Trichlorophenol	1.75E-02	4.29E-02	4.29E-02	---	---	---	---	4.29E-02	RME EPC is max detect	1 of 8
4,4'-DDD	6.96E-03	6.76E-04	6.76E-04	1.22E-03	7.81E-03	4.52E-03	---	6.76E-04	RME EPC is max detect*	3 of 8
4,4'-DDT	4.16E-03	1.57E-03	1.11E-03	1.19E-03	6.29E-02	3.20E-02	1.60E-03	1.57E-03	RME EPC is max detect*	1 of 8
Acetone	2.38E-02	7.98E-02	7.98E-02	1.67E+02	1.00E+04	5.09E+03	---	7.98E-02	RME EPC is max detect	1 of 8
Aluminum	1.17E+04	1.63E+04	7.99E+03	---	---	---	---	1.63E+04	RME EPC is max detect	8 of 8
Antimony	7.95E-01	1.85E+00	3.30E-01	---	---	---	---	1.85E+00	RME EPC is max detect	8 of 8
Arsenic	1.74E+00	5.01E+00	3.39E+00	8.20E+00	7.00E+01	3.91E+01	8.20E+00	5.01E+00	RME EPC is max detect	3 of 8
Barium	1.99E+02	4.17E+02	1.08E+02	---	---	---	---	4.17E+02	RME EPC is max detect	8 of 8
Benzo(b)fluoranthene	4.77E-02	1.06E-01	2.93E-02	---	---	---	---	1.06E-01	RME EPC is max detect	6 of 8
Benzo(g,h,i)perylene	2.40E-02	1.35E-01	1.35E-01	---	---	---	---	1.35E-01	RME EPC is max detect	1 of 8
Benzo(k)fluoranthene	5.27E-02	1.30E-01	1.10E-01	---	---	---	---	1.30E-01	RME EPC is max detect	3 of 8
Beryllium	8.34E-01	1.13E+00	5.80E-01	---	---	---	---	1.13E+00	RME EPC is max detect	8 of 8
beta-BHC	7.96E-03	6.99E-04	6.99E-04	---	---	---	---	7.00E-04	RME EPC is max detect*	1 of 8
Boron	1.50E+01	2.84E+01	1.10E+01	---	---	---	---	2.84E+01	RME EPC is max detect	5 of 8
Bromomethane	8.90E-03	3.10E-02	1.40E-02	---	---	---	---	3.10E-02	RME EPC is max detect	2 of 8
Cadmium	1.47E-01	2.70E-01	1.90E-01	1.20E+00	9.60E+00	5.40E+00	1.20E+00	2.70E-01	RME EPC is max detect	5 of 8
Carbon Disulfide	1.40E-03	7.71E-03	7.71E-03	---	---	---	---	7.70E-03	RME EPC is max detect	1 of 8
Chromium	1.29E+01	2.01E+01	8.29E+00	8.10E+01	3.70E+02	2.26E+02	8.10E+01	2.01E+01	RME EPC is max detect	8 of 8
Chrysene	9.50E-03	2.57E-02	2.57E-02	3.84E-01	2.80E+00	1.59E+00	---	2.57E-02	RME EPC is max detect	1 of 8
Cobalt	6.94E+00	8.99E+00	5.19E+00	---	---	---	---	8.99E+00	RME EPC is max detect	8 of 8
Copper	1.52E+01	2.68E+01	8.33E+00	3.40E+01	2.70E+02	1.52E+02	3.40E+01	2.68E+01	RME EPC is max detect	8 of 8
Iron	1.53E+04	2.01E+04	1.13E+04	---	---	---	---	2.01E+04	RME EPC is max detect	8 of 8
Lead	1.75E+01	3.05E+01	1.06E+01	4.67E+01	2.18E+02	1.32E+02	4.70E+01	3.05E+01	RME EPC is max detect	8 of 8
Lithium	1.85E+01	2.37E+01	1.35E+01	---	---	---	---	2.37E+01	RME EPC is max detect	8 of 8
m,p-Cresol	1.49E-02	3.75E-02	3.75E-02	---	---	---	---	3.75E-02	RME EPC is max detect	1 of 8
Manganese	4.88E+02	7.11E+02	3.52E+02	---	---	---	---	7.11E+02	RME EPC is max detect	8 of 8
Methyl Iodide	8.10E-03	4.10E-02	4.10E-02	---	---	---	---	1.11E-02	RME EPC is max detect	1 of 8
Molybdenum	1.46E-01	6.00E-01	2.10E-01	---	---	---	---	6.00E-01	RME EPC is max detect	2 of 8
Nickel	1.63E+01	2.06E+01	1.23E+01	2.09E+01	5.16E+01	3.63E+01	2.10E+01	2.06E+01	RME EPC is max detect	8 of 8
Pyrene	1.47E-02	2.65E-02	2.01E-02	6.65E-01	2.60E+00	1.63E+00	6.60E-01	2.65E-02	RME EPC is max detect	3 of 8
Strontium	1.04E+02	1.81E+02	6.33E+01	---	---	---	---	1.81E+02	RME EPC is max detect	8 of 8
Titanium	3.00E+01	4.05E+01	1.91E+01	---	---	---	---	4.05E+01	RME EPC is max detect	8 of 8
Vanadium	2.18E+01	2.74E+01	1.68E+01	---	---	---	---	2.74E+01	RME EPC is max detect	8 of 8
Zinc	3.32E+02	9.99E+02	3.82E+01	1.50E+02	4.10E+02	2.80E+02	1.50E+02	9.99E+02	RME EPC is max detect	8 of 8
LPAH**				---	---	---	---			
HPAHs	1.49E-01	4.23E-01	3.20E-01	1.70E+00	9.60E+00	5.65E+00		4.23E-01		
Total PAHs	1.49E-01	1.49E-01	1.49E-01	4.02E+00	4.48E+01	2.44E+01	4.00E+00	4.23E-01		

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected, and because J flag data were used in the risk assessment.

* Chemicals of interest are any chemical measured in at least one sample.

** No LPAHs were detected in the samples.

(1) - From Table 3-3 of TCEQ, 2006.

(2) - From Table A-2 of TCEQ, 2006.

(3) - Midpoint between Sediment PCL and SEL as per memo received on January 24, 2008 from TCEQ.

(4) - From Table 2 of EPA's EcoTox Threshold ECO Update January, 2006.

(5) - Recommended exposure point concentration to be used based on data distribution per Pro UCL (see Appendix A). When the compound was not detected in a given sample, one-half of the sample detection limit was used as the proxy concentration for that sample.

TABLE 10
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY SURFACE WATER (TOTAL)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
Acrylonitrile	9.38E-04	2.10E-03	2.10E-03	2.91E-01	2.10E-03	RME EPC is max detect	1 of 4
Aluminum	4.05E-01	5.50E-01	2.80E-01	---	5.50E-01	RME EPC is max detect	4 of 4
Barium	2.40E-02	2.60E-02	2.20E-02	2.50E+01	2.60E-02	RME EPC is max detect	4 of 4
Boron	4.69E+00	4.81E+00	4.60E+00	---	4.81E+00	RME EPC is max detect	4 of 4
Chromium	7.98E-02	1.20E-01	7.00E-02	---	1.20E-01	RME EPC is max detect	4 of 4
Copper	6.53E-03	1.10E-02	9.10E-03	---	1.10E-02	RME EPC is max detect	2 of 4
Iron	4.63E-01	5.90E-01	3.20E-01	---	5.90E-01	RME EPC is max detect	4 of 4
Lithium	2.53E-01	2.70E-01	2.20E-01	---	2.70E-01	RME EPC is max detect	4 of 4
Manganese	4.03E-02	4.80E-02	3.30E-02	---	4.80E-02	RME EPC is max detect	4 of 4
Silver	2.80E-03	3.70E-03	2.80E-03	---	3.70E-03	RME EPC is max detect	3 of 4
Strontium	7.22E+00	7.35E+00	6.95E+00	---	7.35E+00	RME EPC is max detect	4 of 4
Titanium	3.90E-03	5.70E-03	2.00E-03	---	5.70E-03	RME EPC is max detect	4 of 4
Vanadium	4.25E-02	6.10E-02	3.50E-02	---	6.10E-02	RME EPC is max detect	4 of 4

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

TABLE 11
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY BACKGROUND SURFACE WATER (TOTAL)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
4,4'-DDD	3.30E-06	7.62E-06	3.60E-06	2.50E-05	7.62E-06	RME EPC is max detect	2 of 4
4,4'-DDT	4.93E-06	1.30E-05	1.30E-05	1.00E-06	1.30E-05	RME EPC is max detect	1 of 4
Acetone	1.47E-03	4.52E-03	4.52E-03	2.82E+02	4.52E-03	RME EPC is max detect	1 of 4
Aldrin	9.24E-06	1.10E-05	4.40E-06	6.50E-04 ⁽³⁾	1.10E-05	RME EPC is max detect	4 of 4
Aluminum	2.44E-01	4.00E-01	2.10E-01	---	4.00E-01	RME EPC is max detect	4 of 4
Barium	1.96E-02	2.00E-02	2.00E-02	2.50E+01	2.00E-02	RME EPC is max detect	4 of 4
Benzo(g,h,i)perylene	1.20E-04	2.02E-04	2.02E-04	3.00E-01 ⁽³⁾	2.02E-04	RME EPC is max detect	1 of 4
Benzo(k)fluoranthene	1.73E-04	3.11E-04	3.11E-04	3.00E-01 ⁽³⁾	3.11E-04	RME EPC is max detect	1 of 4
Bis(ethylhexyl) Phthalate	4.17E-03	1.97E-02	1.94E-02	3.60E-01 ⁽²⁾	1.97E-02	RME EPC is max detect	2 of 4
Boron	4.38E+00	4.50E+00	4.27E+00	---	4.50E+00	RME EPC is max detect	4 of 4
Chromium	7.84E-02	7.90E-02	7.80E-02	---	7.90E-02	RME EPC is max detect	4 of 4
Chromium VI	6.20E-03	1.10E-02	1.10E-02	---	1.10E-02	RME EPC is max detect	1 of 4
Chrysene	1.61E-04	3.68E-04	3.68E-04	3.00E-01 ⁽³⁾	3.68E-04	RME EPC is max detect	1 of 4
Di-n-butyl Phthalate	6.70E-04	1.42E-03	8.28E-04	5.00E-03	1.42E-03	RME EPC is max detect	2 of 4
Di-n-octyl Phthalate	2.65E-04	6.50E-04	6.50E-04	3.4E-03 ⁽²⁾	6.50E-04	RME EPC is max detect	1 of 4
Iron	3.40E-01	4.30E-01	3.40E-01	---	4.30E-01	RME EPC is max detect	4 of 4
Lithium	3.00E-01	3.40E-01	2.70E-01	---	3.40E-01	RME EPC is max detect	4 of 4
Manganese	3.60E-02	4.10E-02	3.40E-02	---	4.10E-02	RME EPC is max detect	4 of 4
Methoxychlor	3.66E-06	1.40E-05	1.40E-05	3.00E-05	1.40E-05	RME EPC is max detect	1 of 4
Molybdenum	2.72E-03	4.20E-03	1.80E-03	---	4.20E-03	RME EPC is max detect	2 of 4
Silver	5.43E-03	5.90E-03	4.70E-03	---	5.90E-03	RME EPC is max detect	4 of 4
Strontium	7.76E+00	8.31E+00	7.31E+00	---	8.31E+00	RME EPC is max detect	4 of 4
Titanium	2.98E-03	4.20E-03	2.40E-03	---	4.20E-03	RME EPC is max detect	4 of 4
Vanadium	4.14E-02	3.70E-02	1.10E-02	---	3.70E-02	RME EPC is max detect	4 of 4
LPAHs ^{**}				---			
HPAHs	4.55E-04	8.81E-04	8.81E-04	3.00E-01 ⁽³⁾	8.81E-04		
Total PAHs	4.55E-04	4.55E-04	4.55E-04	3.00E-01 ⁽³⁾	4.55E-04		

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

^{**} No LPAHs were detected in the samples.

(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

(2) - Buchman, 2008.

(3) - Buchman, 2008 acute value for chemical class.

TABLE 12
EXPOSURE POINT CONCENTRATION (mg/L)
WETLAND SURFACE WATER (TOTAL)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
1,2-Dichloroethane	2.30E-03	3.85E-03	2.55E-03	5.65E+00	3.85E-03	RME EPC is max detect	3 of 4
Acrolein	1.21E-02	9.29E-03	9.29E-03	5.00E-03	9.30E-03	RME EPC is max detect*	1 of 4
Aluminum	5.08E-01	8.00E-01	1.70E-01	---	8.00E-01	RME EPC is max detect	4 of 4
Barium	2.20E-01	3.70E-01	1.50E-01	2.50E+01	3.70E-01	RME EPC is max detect	4 of 4
Boron	1.96E+00	2.42E+00	8.30E-01	---	2.42E+00	RME EPC is max detect	4 of 4
Chromium	1.49E-02	3.70E-02	2.00E-02	---	3.70E-02	RME EPC is max detect	2 of 4
Chromium VI	3.13E-03	8.00E-03	8.00E-03	---	8.00E-03	RME EPC is max detect	1 of 4
Copper	6.38E-03	1.10E-02	9.50E-03	---	1.10E-02	RME EPC is max detect	2 of 4
Iron	6.45E-01	1.08E+00	1.90E-01	---	1.08E+00	RME EPC is max detect	4 of 4
Lithium	1.89E-01	2.50E-01	5.70E-02	---	2.50E-01	RME EPC is max detect	4 of 4
Manganese	1.37E-01	3.40E-01	1.80E-02	---	3.40E-01	RME EPC is max detect	4 of 4
Mercury	3.75E-05	7.00E-05	4.00E-05	---	7.00E-05	RME EPC is max detect	2 of 4
Molybdenum	9.30E-03	1.50E-02	5.60E-03	---	1.50E-02	RME EPC is max detect	3 of 4
Nickel	1.10E-03	2.20E-03	1.20E-03	---	2.20E-03	RME EPC is max detect	2 of 4
Strontium	5.27E+00	6.64E+00	1.87E+00	---	6.64E+00	RME EPC is max detect	4 of 4
Titanium	6.40E-03	9.80E-03	2.40E-03	---	9.80E-03	RME EPC is max detect	4 of 4
Zinc	7.30E-03	2.20E-02	2.20E-02	---	2.20E-02	RME EPC is max detect	1 of 4

Notes:

*The maximum detected value is sometimes lower than the average since 1/2 of the reporting limit was used as a proxy value when it was not detected, and because J flag data were used in the risk assessment.

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

TABLE 13
EXPOSURE POINT CONCENTRATION (mg/L)
POND SURFACE WATER (TOTAL)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
4-Chloroaniline	2.79E-04	8.23E-04	8.23E-04	1.29E-01 ⁽²⁾	8.00E-04	RME EPC is max detect	1 of 6
Aluminum	9.13E-01	2.22E+00	4.10E-01	---	2.22E+00	RME EPC is max detect	5 of 6
Antimony	3.82E-03	7.60E-03	3.00E-03	---	7.60E-03	RME EPC is max detect	3 of 6
Arsenic	5.40E-03	1.30E-02	1.20E-02	---	1.30E-02	RME EPC is max detect	2 of 6
Barium	1.45E-01	1.90E-01	1.30E-01	2.50E+01	1.90E-01	RME EPC is max detect	6 of 6
Benzo(a)pyrene	1.12E-04	3.48E-04	3.48E-04	3.00E-01 ⁽³⁾	3.00E-04	RME EPC is max detect	1 of 6
Benzo(b)fluoranthene	4.03E-04	1.81E-03	1.81E-03	3.00E-01 ⁽³⁾	1.80E-03	RME EPC is max detect	1 of 6
Benzo(g,h,i)perylene	3.71E-04	1.73E-03	1.73E-03	3.00E-01 ⁽³⁾	1.70E-03	RME EPC is max detect	1 of 6
Benzo(k)fluoranthene	2.06E-04	5.42E-04	5.42E-04	3.00E-01 ⁽³⁾	5.00E-04	RME EPC is max detect	1 of 6
Bis(2-ethylhexyl)phthalate	1.92E-02	4.00E-02	2.90E-02	3.60E-01 ⁽²⁾	4.00E-02	RME EPC is max detect	3 of 6
Boron	2.97E+00	3.52E+00	2.45E+00	---	3.52E+00	RME EPC is max detect	6 of 6
Chromium	8.50E-04	1.50E-03	1.50E-03	---	1.50E-03	RME EPC is max detect	1 of 6
Chromium VI	8.50E-03	1.60E-02	1.50E-02	---	1.60E-02	RME EPC is max detect	2 of 6
Chrysene	2.48E-04	7.10E-04	7.10E-04	3.00E-01 ⁽³⁾	7.00E-04	RME EPC is max detect	1 of 6
Cobalt	9.12E-04	3.20E-03	5.20E-04	---	3.20E-03	RME EPC is max detect	2 of 6
Dibenz(a,h)anthracene	6.26E-04	3.04E-03	3.04E-03	3.00E-01 ⁽³⁾	3.00E-03	RME EPC is max detect	1 of 6
Di-n-butyl Phthalate	3.12E-03	3.81E-03	1.07E-03	5.00E-03	3.80E-03	RME EPC is max detect	5 of 6
Indeno(1,2,3-cd)pyrene	6.73E-04	3.44E-03	3.44E-03	3.00E-01 ⁽³⁾	3.40E-03	RME EPC is max detect	1 of 6
Iron	2.27E+00	6.67E+00	5.20E-01	---	6.67E+00	RME EPC is max detect	6 of 6
Lead	2.63E-03	1.10E-02	1.10E-02	---	1.10E-02	RME EPC is max detect	1 of 6
Lithium	1.16E-01	1.60E-01	6.70E-02	---	1.60E-01	RME EPC is max detect	6 of 6
Manganese	6.37E-01	1.44E+00	8.50E-02	---	1.44E+00	RME EPC is max detect	6 of 6
Molybdenum	8.73E-03	1.80E-02	1.30E-02	---	1.80E-02	RME EPC is max detect	3 of 6
Nickel	4.60E-03	7.90E-03	3.00E-03	---	7.90E-03	RME EPC is max detect	6 of 6
Selenium	4.26E-03	9.80E-03	9.80E-03	1.36E-01	9.80E-03	RME EPC is max detect	1 of 6
Silver	9.30E-03	1.50E-02	3.70E-03	---	1.50E-02	RME EPC is max detect	6 of 6
Strontium	4.47E+00	7.19E+00	1.77E+00	---	7.19E+00	RME EPC is max detect	6 of 6
Thallium	2.86E-03	7.70E-03	6.20E-03	2.13E-02	7.70E-03	RME EPC is max detect	2 of 6
Titanium	1.90E-02	4.40E-02	2.10E-03	---	4.40E-02	RME EPC is max detect	6 of 6
Vanadium	3.20E-03	8.40E-03	4.30E-03	---	8.40E-03	RME EPC is max detect	3 of 6
Zinc	1.20E-01	6.30E-01	2.70E-02	---	6.30E-01	RME EPC is max detect	3 of 6
LPAHs				---			
HPAHs	2.64E-03	1.16E-02	1.16E-02	3.00E-01 ⁽³⁾	1.14E-02		
Total PAHs	2.64E-03	2.64E-03	2.64E-03	3.00E-01 ⁽³⁾	2.64E-03		

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ, 2006 and only the TCEQ Ecological Benchmarks for Water without the "dissolved" notation were included in the table.

(2) - Buchman, 2008.

(3) - Buchman, 2008 acute value for chemical class.

TABLE 14
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
Aluminum	6.48E-02	4.70E-02	4.70E-02	---	4.70E-02	RME EPC is max detect	1 of 4
Barium	2.63E-02	2.80E-02	2.30E-02	2.50E+01	2.80E-02	RME EPC is max detect	4 of 4
Boron	4.79E+00	4.99E+00	4.30E+00	1.20E+00 ⁽²⁾	4.99E+00	RME EPC is max detect	4 of 4
Lithium	2.10E-01	2.20E-01	2.00E-01	---	2.20E-01	RME EPC is max detect	4 of 4
Manganese	4.85E-03	6.00E-03	2.50E-03	1.00E-01 ⁽²⁾	6.00E-03	RME EPC is max detect	4 of 4
Nickel	2.63E-03	3.30E-03	1.30E-03	1.31E-02	3.30E-03	RME EPC is max detect	4 of 4
Selenium	4.25E-02	6.30E-02	2.80E-02	1.36E-01	6.30E-02	RME EPC is max detect	4 of 4
Strontium	8.04E+00	8.47E+00	7.36E+00	---	8.47E+00	RME EPC is max detect	4 of 4

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ.

(2) - Buchman, 2008.

TABLE 15
EXPOSURE POINT CONCENTRATION (mg/L)
INTRACOASTAL WATERWAY BACKGROUND SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water	RME EPC	Statistic Used	# of Detects/# of Samples
Barium	1.65E-02	1.90E-02	1.20E-02	2.50E+01	1.90E-02	RME EPC is max detect	4 of 4
Boron	3.98E+00	4.33E+00	3.04E+00	1.20E+00 ⁽²⁾	4.33E+00	RME EPC is max detect	4 of 4
Chromium	7.38E-02	7.80E-02	6.40E-02	1.03E-01	7.80E-02	RME EPC is max detect	4 of 4
Iron	5.40E-02	6.00E-02	6.00E-02	5.00E-02 ⁽²⁾	6.00E-02	RME EPC is max detect	1 of 4
Lithium	2.90E-01	3.90E-01	1.90E-01	---	3.90E-01	RME EPC is max detect	4 of 4
Manganese	1.53E-02	1.80E-02	1.10E-02	1.00E-01 ⁽²⁾	1.80E-02	RME EPC is max detect	4 of 4
Molybdenum	3.68E-03	3.90E-03	3.90E-03	2.30E-02 ⁽²⁾	3.90E-03	RME EPC is max detect	1 of 4
Silver	5.23E-03	5.80E-03	4.30E-03	1.90E-04	5.80E-03	RME EPC is max detect	4 of 4
Strontium	6.84E+00	7.46E+00	5.20E+00	---	7.46E+00	RME EPC is max detect	4 of 4
Vanadium	1.23E-02	1.50E-02	9.30E-03	5.00E-02 ⁽²⁾	1.50E-02	RME EPC is max detect	4 of 4

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) - From Table 3-2 of TCEQ.

(2) - Buchman, 2008.

TABLE 16
EXPOSURE POINT CONCENTRATION (mg/L)
WETLAND SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
Barium	3.20E-04	3.50E-01	1.40E-01	2.50E+01	3.50E-01	RME EPC is max detect	4 of 4
Boron	2.70E-02	2.75E+00	8.50E-01	1.20E+00 ⁽²⁾	2.75E+00	RME EPC is max detect	4 of 4
Chromium	1.20E-03	3.70E-02	1.90E-02	1.03E-01	3.70E-02	RME EPC is max detect	2 of 4
Copper	2.50E-03	1.10E-02	5.30E-03	3.60E-03	1.10E-02	RME EPC is max detect	3 of 4
Lithium	3.50E-03	2.80E-01	5.70E-02	---	2.80E-01	RME EPC is max detect	4 of 4
Manganese	6.00E-04	3.30E-01	2.50E-02	1.00E-01 ⁽²⁾	3.30E-01	RME EPC is max detect	4 of 4
Molybdenum	2.70E-03	1.70E-02	5.40E-03	2.30E-02 ⁽²⁾	1.70E-02	RME EPC is max detect	3 of 4
Nickel	4.50E-04	1.30E-03	4.90E-04	1.31E-02	1.30E-03	RME EPC is max detect	2 of 4
Strontium	9.40E-04	7.01E+00	1.89E+00	---	7.01E+00	RME EPC is max detect	4 of 4

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) From Table 3-2 of TCEQ, 2006.

(2) - Buchman, 2008.

TABLE 17
EXPOSURE POINT CONCENTRATION (mg/L)
POND SURFACE WATER (DISSOLVED METALS)

Chemicals of Interest ⁺	Average	Max Detection	Min Detection	TCEQ Ecological Benchmark for Water ⁽¹⁾	RME EPC	Statistic Used	# of Detects/# of Samples
Antimony	3.50E-03	6.30E-03	3.10E-03	5.00E-01 ⁽²⁾		RME EPC is max detect	3 of 6
Barium	1.25E-01	1.30E-01	1.20E-01	25		RME EPC is max detect	6 of 6
Boron	2.79E+00	3.33E+00	2.36E+00	1.20E+00 ⁽²⁾		RME EPC is max detect	6 of 6
Lithium	1.45E-01	2.20E-01	8.00E-02	---		RME EPC is max detect	6 of 6
Manganese	4.65E-01	1.06E+00	6.60E-02	1.00E-01 ⁽²⁾		RME EPC is max detect	6 of 6
Molybdenum	1.01E-02	1.90E-02	1.80E-02	2.30E-02 ⁽²⁾		RME EPC is max detect	3 of 6
Nickel	1.43E-03	2.60E-03	1.90E-03	0.131		RME EPC is max detect	3 of 6
Silver	1.83E-03	2.90E-03	9.40E-04	0.00019		RME EPC is max detect	6 of 6
Strontium	4.32E+00	6.97E+00	1.78E+00	---		RME EPC is max detect	6 of 6
Thallium	1.53E-03	3.20E-03	1.40E-03	0.0213		RME EPC is max detect	3 of 6
Vanadium	7.58E-04	2.10E-03	2.10E-03	5.00E-02 ⁽²⁾		RME EPC is max detect	1 of 6

Notes:

⁺ Chemicals of interest are any chemical measured in at least one sample.

(1) From Table 3-2 of TCEQ, 2006.

(2) - Buchman, 2008.

TABLE 18
TERRESTRIAL HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Invertebrates	Earthworm	Protection of soil invertebrate community from uptake and direct toxic effects on detritivore abundance, diversity, productivity due to chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the abundance, diversity, productivity, and function? 2) Do soil-to-earthworm BAFs suggest uptake of chemicals?	Average and 95%UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Small mammalian herbivore	Deer mouse	Protection of the small mammal survival, growth, and reproduction due to uptake of chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-mammal BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Mammalian predator	Coyote	Protection of the mammalian predator survival, growth, and reproduction due to the uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-mammal BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Reptilian predator	Rat snake	Protection of the reptilian predator survival, growth, and reproduction due to the uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-mammal BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian herbivore/omnivore	American robin	Protection of the omnivorous avian survival, growth, and reproduction due to uptake of chemicals in soil.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-avian omnivore BAFs suggest uptake of chemicals?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian predator	Red-tailed hawk	Protection of carnivorous avian community population abundance, diversity, and productivity due to uptake of chemicals in prey items.	1) Does exposure to chemicals in soil adversely affect the survival, growth, and reproduction? 2) Do soil-to-higher trophic level BAFs suggest uptake of chemicals and/or bioaccumulation?	Average and 95% UCL soil concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in soil to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.

Notes:

SLERA -- Screening-Level Ecological Risk Assessment

BAF -- biota accumulation factor

BSAF -- biota to sediment accumulation factor

NOAEL -- no observable adverse effects level

95% UCL -- 95 percent upper confidence limit on the mean

TABLE 19
ESTUARINE WETLAND AND AQUATIC HABITAT ASSESSMENT AND MEASUREMENT ENDPOINTS

Receptor Group	Receptor of Potential Concern	Assessment Endpoint for SLERA	Ecological Risk Question	Testable Hypothesis for SLERA	Measurement Endpoint
Benthos and zooplankton	Polychaetes	Protection of benthic invertebrate community from uptake and direct toxic effects on abundance, diversity, and productivity due to chemicals in sediment.	1) Does exposure to chemicals in sediment adversely affect the abundance, diversity, productivity, and function? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate. 3) Evaluate likelihood of localized effects (maximum concentration).
Fish and shellfish	Fiddler crab	Protection of invertebrate community abundance, diversity, and productivity due to uptake of chemicals in sediment.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Killifish	Protection of localized herbivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment and biota.	1) Does exposure to chemical in sediment adversely affect the survival, reproduction, or growth? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Carnivorous fish	Black drum	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in sediment and prey items.	1) Does exposure to chemicals in sediment and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivorous fish? 2) Do sediment-to-biota BSAFs suggest uptake of chemicals and/or bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Spotted seatrout	Protection of carnivorous fish survival, growth, and reproduction due to uptake of chemicals in prey items.	1) Does exposure to chemicals in prey items adversely affect the survival, growth, and reproduction of a second order carnivorous fish? 2) Does sediment-to-biota BSAF suggest bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
Avian predator	Sandpiper	Protection of carnivorous avian survival, growth, and reproduction due to uptake of chemicals in sediment and prey items.	1) Does exposure to chemicals in sediment and/or prey items adversely affect the survival, growth, and reproduction of a first order carnivore? 2) Does sediment-to-biota BSAF suggest uptake or bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.
	Green heron	Protection of carnivorous avian survival, growth and reproduction due to uptake of chemicals in prey items.	1) Does exposure to chemicals in prey items adversely affect the survival, growth, and reproduction of a second order carnivore? 2) Does sediment-to-biota BSAF suggest bioaccumulation?	Average and 95% UCL sediment concentrations do not exceed screening criteria.	1) Comparison of average and 95% UCL concentration for each compound measured at the Site in sediment to receptor-specific screening level based on NOAELs available in the literature. 2) Evaluate compound's ability to bioconcentrate.

Notes:

SLERA -- Screening-Level Ecological Risk Assessment

BAF -- biota accumulation factor

BSAF -- biota to sediment accumulation factor

NOAEL -- no observable adverse effects level

95% UCL -- 95 percent upper confidence limit on the mean

TABLE 20
BACKGROUND COMPARISONS

HYPOTHESIS TESTED: ARE SITE DATA STATISTICALLY DIFFERENT THAN BACKGROUND DATA? ⁽¹⁾							
CHEMICAL OF INTEREST*	SOUTH SURFACE SOIL	SOUTH SOIL	NORTH SURFACE SOIL	NORTH SOIL	ICWW SEDIMENT	WETLANDS SEDIMENT	POND SEDIMENT
Aluminum	NA	NA	NA	NA	Yes*	NA	NA
Antimony	No	No	No	No	Yes*	No	No
Arsenic	No	No	No	No	Yes*	No	Yes*
Barium	No	No	Yes*	Yes*	No	Yes*	No
Beryllium	NA	NA	NA	NA	Yes*	NA	NA
Boron	NA	NA	NA	NA	Yes*	NA	NA
Cadmium	No	No	Yes	Yes*	NA	Yes	Yes
Chromium	No	No	No	No	NA	No	No
Cobalt	NA	NA	NA	NA	Yes*	NA	NA
Copper	Yes	No	No	No	No	No	No
Iron	NA	NA	NA	NA	No	NA	No
Lead	Yes	No	No	No	No	No	Yes
Lithium	Yes*	Yes*	Yes*	No	Yes*	No	No
Manganese	Yes*	Yes*	No	No	No	No	Yes
Mercury	No	No	Yes*	Yes*	No	No	NA
Molybdenum	Yes	No	No	No	No	No	Yes*
Nickel	NA	NA	NA	NA	No	NA	NA
Strontium	NA	NA	NA	NA	Yes*	NA	NA
Titanium	NA	NA	NA	NA	Yes*	NA	NA
Vanadium	NA	NA	NA	NA	Yes*	NA	NA
Zinc	Yes	No	No	No	No	No	No

Notes:

⁽¹⁾ Detailed statistical procedures are outlined in Section 2.7 and calculations are provided in Appendix B.

* Statistical difference is due to background being greater than site.

+ Chemicals of interest are any chemical measured in at least one sample.

NA - No analysis was performed for compound in background.

TABLE 21
COPECS IDENTIFIED IN STEP 1 AND QUANTITATIVELY EVALUATED IN STEP 2*

SOUTH AREA SOIL	NORTH AREA SOIL	BACKGROUND AREA SOIL	ICWW SEDIMENT	BACKGROUND ICWW SEDIMENT	WETLANDS SEDIMENT	POND SEDIMENT
2-Methylnaphthalene 4,4'-DDD 4,4'-DDE 4,4'-DDT Acenaphthene Acenaphthylene Anthracene Aroclor-1254 Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Boron Chrysene Cobalt Copper Dibenz(a,h)anthracene Dieldrin Endrin Aldehyde Endrin Ketone Fluoranthene Fluorene gamma-Chlordane Indeno(1,2,3-cd)pyrene Lead Molybdenum Naphthalene Nickel Phenanthrene Pyrene Vanadium Zinc LPAH HPAH TOTAL PAHs	2-Methylnaphthalene 4,4'-DDE 4,4'-DDT Acenaphthene Acenaphthylene Anthracene Aroclor-1254 Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Boron Cadmium Chrysene Dibenz(a,h)anthracene Dieldrin Endrin Endrin Ketone Fluoranthene Fluorene Indeno(1,2,3-cd)pyrene Iron Naphthalene Nickel Phenanthrene Pyrene Vanadium LPAH HPAH TOTAL PAHs	Antimony Arsenic Barium Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Cadmium Chromium Chrysene Copper Fluoranthene Indeno(1,2,3-cd)pyrene Lead Lithium Manganese Mercury Molybdenum Phenanthrene Pyrene Zinc LPAH HPAH TOTAL PAHs	2-Methylnaphthalene 4,4'-DDT Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Chrysene Dibenz(a,h)anthracene Fluoranthene Fluorene gamma-Chlordane Hexachlorobenzene Indeno(1,2,3-cd)pyrene Phenanthrene Pyrene LPAH HPAH TOTAL PAHs	4,4'-DDT Arsenic Benzo(b)fluoranthene Copper Mercury Nickel Zinc LPAH HPAH TOTAL PAHs	2-Methylnaphthalene 4,4'-DDT Acenaphthene Acenaphthylene Anthracene Benzo(a)anthracene Benzo(a)pyrene Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Cadmium Chrysene Nickel Phenanthrene Pyrene LPAH HPAH TOTAL PAHs	4,4'-DDD 4,4'-DDT Benzo(b)fluoranthene Benzo(g,h,i)perylene Benzo(k)fluoranthene Cadmium Chrysene Nickel Phenanthrene Pyrene LPAH HPAH TOTAL PAHs

Notes:

* Surface water is not included in the table because they were evaluated differently given the lack of screening criteria and toxicity reference values.

TABLE 22
TERRESTRIAL EXPOSURE PARAMETERS

PARAMETER	Deer Mouse		Coyote		Rat Snake		American Robin		Red-Tailed Hawk	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Ingestion Rate for soil (kg/day)	2.13E-05	EPA, 1999*	NA		1.45E-04	EPA, 1993 ⁺	1.14E-03	EPA, 1999*	NA	
Bioavailability Factor in soil (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Area Use Factor (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Body Weight (kg)	1.48E-02	EPA, 1999	1.55E+01	EPA, 1993	1.39E-01	EPA, 1993	8.00E-02	EPA, 1999	9.60E-01	EPA, 1999
Ingestion Rate for food (kg/day)	8.87E-03	EPA, 1999*	1.55	EPA, 1993*	2.78E-03	EPA, 1993*	3.52E-02	EPA, 1999*	1.78E-01	EPA, 1999*
Dietary Fraction for arthropods (unitless)	5.60E-01	EPA, 1993	NA		2.00E-01	EPA, 1993	4.60E-01	EPA, 1993	NA	
Dietary Fraction for plants, etc. (unitless)	4.40E-01	EPA, 1993	NA		NA		8.00E-02	EPA, 1993	NA	
Dietary Fraction of small mammals (unitless)	NA		7.50E-01	EPA, 1993	6.20E-01	EPA, 1993	NA		7.85E-01	EPA, 1993
Dietary Fraction of birds (unitless)	NA		2.50E-01	EPA, 1993	1.80E-01	EPA, 1993	NA		3.80E-01	EPA, 1993
Dietary Fraction of earthworms (unitless)	NA		NA		NA		4.60E-01	EPA, 1993	NA	

Notes:

* Normalized for body weight.

NA - not applicable.

⁺ Soil ingestion was assumed to be 5.2% of dietary intake per other reptiles listed in EPA, 1993.

TABLE 23
ESTUARINE WETLAND AND AQUATIC EXPOSURE PARAMETERS

PARAMETER	Fiddler Crab		Killifish		Black Drum		Spotted Seatrout		Sandpiper		Green Heron	
	Value	Reference	Value	Reference	Value	Reference	Value	Reference	Value	Reference	Value	Reference
Ingestion Rate for soil (kg/day)	1.16E-08	Cammen, 1979			2.60E-03	Neill, 1998+	NA		2.10E-02	EPA, 1993	NA	
Bioavailability Factor in soil (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Area Use Factor (unitless)	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997	1	EPA, 1997
Body Weight (kg)	9.00E-03	*			1.24	Alcoa, 2000	1.00E+00	TPWD, 2009**	2.15E-01	Dunning, 1993	3.75E-01	Dunning, 1993
Ingestion Rate for food (kg/day)	1.16E-08	Cammen, 1979			2.60E-02	Neill, 1998	2.60E-02	Prof. Judg.**	1.08E-01	EPA, 1993	1.13E-01	EPA, 1993
Dietary Fraction for invertebrates (unitless)	1.00E+00	TPWD, 2009**			NA		NA		NA		NA	
Dietary Fraction for worms (unitless)	NA				3.33E-01	Prof. Judg.**	NA		6.00E-01	Prof. Judg.**	NA	
Dietary Fraction of crabs (unitless)	NA				3.33E-01	Prof. Judg.**	NA		4.00E-01	Prof. Judg.**	2.50E-01	Kent, 1986
Dietary Fraction of fish (unitless)	NA				3.33E-01	Prof. Judg.**	1.00E+00	TPWD, 2009**	NA		7.50E-01	Kent, 1986

Notes:

* Estimated based on width/length equation for fiddler crabs.

** Because of the lack of information on dietary fractions for different species, best professional judgment was used as the basis for the assumption.

NA - not applicable.

* Sediment ingestion was assumed to be 10% of dietary intake.

** <http://www.tpwd.state.tx.us>

TABLE 24
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR THE SOUTH AREA

MEDIA	RECEPTOR	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE	AVERAGE HQ	RME HQ
Soil	Earthworm	4,4'-DDD	NOAEL	1.78E-01	1.16E+00
		Zinc	NOAEL	3.62E+00	6.79E+00
	Deer Mouse	Aroclor-1254	NOAEL	5.07E-01	1.83E+00
		Copper	NOAEL	5.21E-01	1.01E+00
		Zinc	NOAEL	1.09E+00	2.05E+00
	Coyote	None	NOAEL		
	Rat Snake	None	NOAEL		
	American Robin	Aroclor-1254	NOAEL	5.32E-01	1.94E+00
		Lead	NOAEL	1.06E+00	1.61E+00
		Zinc	NOAEL	1.62E+00	2.95E+00
	Red-Tailed Hawk	None	NOAEL		
	Earthworm	Zinc	LOAEL	8.06E-01	1.52E+00
	Deer Mouse	None	LOAEL		
	Coyote	None	LOAEL		
	Rat Snake	None	LOAEL		
	American Robin	None	LOAEL		
	Red-Tailed Hawk	None	LOAEL		
Intracoastal Waterway Sediment	Capitella Capitata	4,4'-DDT	ERL	4.11E-01	2.30E+00
		Benzo(a)anthracene	ERL	1.74E-01	1.15E+00
		Dibenz(a,h)anthracene	ERL	6.86E-01	3.23E+00
		Fluoranthene	ERL	1.88E-01	1.02E+00
		Fluorene	ERL	6.42E-01	1.28E+00
		gamma-Chlordane	ERL	6.26E-01	1.14E+00
		Hexachlorobenzene	AET	1.67E+00	2.10E+00
		Phenanthrene	ERL	3.11E-01	1.62E+00
		Pyrene	ERL	1.95E-01	1.02E+00
		HPAH	ERL	4.54E-01	2.22E+00
		Total PAHs	ERL	2.24E-01	1.06E+00
	Capitella Capitata	None	ERM		
	Fiddler Crab	None	NOAEL		
	Black Drum	None	NOAEL		
	Spotted Seatrout	None	NOAEL		
	Sandpiper	None	NOAEL		
	Green Heron	None	NOAEL		

Notes:

AET - apparent effects threshold

ERL - effects range low

ERM - effects range medium

HQ - hazard quotient

LOAEL - lowest observable adverse effects level

NOAEL - no observable adverse effects level

RME - reasonable maximum exposure

TABLE 25
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR THE NORTH AREA

MEDIA	RECEPTOR	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE	AVERAGE HQ	RME HQ
Soil	Earthworm	None	NOAEL	<i>1.60E-01</i>	<i>1.12E+00</i>
	Deer Mouse	<i>Dieldrin</i>	<i>NOAEL</i>		
	Coyote	None	NOAEL		
	Rat Snake	None	NOAEL		
	American Robin	None	NOAEL		
	Red-Tailed Hawk	None	NOAEL		
	Earthworm	None	LOAEL		
	Deer Mouse	None	LOAEL		
	Coyote	None	LOAEL		
	Rat Snake	None	LOAEL		
	American Robin	None	LOAEL		
	Red-Tailed Hawk	None	LOAEL		
Wetlands Sediment	Capitella Capitata	<i>2-Methylnaphthalene</i>	<i>ERL</i>	<i>2.84E-01</i>	<i>1.02E+00</i>
		<i>4,4'-DDT</i>	<i>ERL</i>	<i>9.07E-01</i>	<i>2.12E+00</i>
		<i>Acenaphthylene</i>	<i>ERL</i>	<i>1.02E+00</i>	<i>3.93E+00</i>
		<i>Acenaphthene</i>	<i>ERL</i>	<i>7.02E-01</i>	<i>3.68E+00</i>
		<i>Anthracene</i>	<i>ERL</i>	<i>3.92E-01</i>	<i>1.57E+00</i>
		<i>Benzo(a)anthracene</i>	<i>ERL</i>	<i>2.36E-01</i>	<i>1.19E+00</i>
		<i>Benzo(a)pyrene</i>	<i>ERL</i>	<i>2.37E-01</i>	<i>1.09E+00</i>
		<i>Benzo(g,h,i)perylene</i>	<i>AET</i>	<i>2.90E-01</i>	<i>1.11E+00</i>
		<i>Chrysene</i>	<i>ERL</i>	<i>5.55E-01</i>	<i>3.17E+00</i>
		<i>Dibenz(a,h)anthracene</i>	<i>ERL</i>	<i>3.14E+00</i>	<i>1.70E+01</i>
		<i>Endrin Aldehyde</i>	<i>ERL</i>	<i>3.90E-01</i>	<i>1.10E+00</i>
		<i>Fluoranthene</i>	<i>ERL</i>	<i>1.77E-01</i>	<i>1.04E+00</i>
		<i>Fluorene</i>	<i>ERL</i>	<i>9.63E-01</i>	<i>3.29E+00</i>
		<i>gamma-Chlordane</i>	<i>ERL</i>	<i>7.76E-01</i>	<i>1.57E+00</i>
		<i>Indeno(1,2,3-cd)pyrene</i>	<i>AET</i>	<i>3.28E-01</i>	<i>1.28E+00</i>
		<i>Phenanthrene</i>	<i>ERL</i>	<i>3.16E-01</i>	<i>1.77E+00</i>
		<i>LPAH</i>	<i>ERL</i>	<i>3.58E-01</i>	<i>1.66E+00</i>
		<i>HPAH</i>	<i>ERL</i>	<i>8.10E-01</i>	<i>3.83E+00</i>
		<i>Total PAHs</i>	<i>ERL</i>	<i>3.91E-01</i>	<i>1.85E+00</i>
	Fiddler Crab	None	NOAEL	7.65E-01	4.15E+00
	Sandpiper	None	NOAEL		
	Green Heron	None	NOAEL		
	Capitella Capitata	Dibenz(a,h)anthracene	ERM		
	Fiddler Crab	None	LOAEL		
	Sandpiper	None	LOAEL		
	Green Heron	None	LOAEL		
Pond Sediment	Capitella Capitata	<i>4,4-DDT*</i>	<i>ERL</i>	<i>4.16E+00</i>	<i>1.47E+00</i>
	Fiddler Crab	None	NOAEL	<i>8.98E-01</i>	<i>1.13E+00</i>
	Sandpiper	<i>Nickel</i>	<i>NOAEL</i>		
	Green Heron	None	NOAEL		
	Capitella Capitata	None	ERM		
	Fiddler Crab	None	LOAEL		
	Sandpiper	None	LOAEL		
	Green Heron	None	LOAEL		

Notes:

* Average HQ is higher than RME HQ because the RME concentration was the maximum detected while the average concentration calculation contained 1/2 sample quantitation limits which sometimes were higher than the max. detect.

ERL - effects range low

ERM - effects range medium

HQ - hazard quotient

LOAEL - lowest observable adverse effects level

NOAEL - no observable adverse effects level

RME - reasonable maximum exposure

TABLE 26
ECOLOGICAL HAZARD QUOTIENTS EXCEEDING ONE FOR THE BACKGROUND AREAS

MEDIA	RECEPTOR	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	TOXICITY VALUE	AVERAGE HQ	RME HQ
Soil	Earthworm	<i>Barium</i>	NOAEL	1.01E+00	1.52E+00
		<i>Zinc</i>	NOAEL	2.06E+00	8.08E+00
	Deer Mouse	<i>Antimony</i>	NOAEL	9.76E-01	2.24E+00
		<i>Barium</i>	NOAEL	7.38E-01	1.11E+00
		<i>Zinc</i>	NOAEL	6.20E-01	2.43E+00
	Coyote	None	NOAEL		
	Rat Snake	None	NOAEL		
	American Robin	<i>Antimony</i>	NOAEL	8.41E-01	1.93E+00
		<i>Barium</i>	NOAEL	6.98E-01	1.05E+00
		<i>Zinc</i>	NOAEL	9.00E-01	3.53E+00
	Red-Tailed Hawk	None	NOAEL		
	Earthworm	Barium	LOAEL	1.01E+00	1.52E+00
		Zinc	LOAEL	4.59E-01	1.80E+00
	Deer Mouse	None	LOAEL		
	Coyote	None	LOAEL		
	Rat Snake	None	LOAEL		
	American Robin	None	LOAEL		
	Red-Tailed Hawk	None	LOAEL		
Intracoastal Waterway Sediment	Capitella Capitata	None	NOAEL		
	Fiddler Crab	None	NOAEL		
	Black Drum	None	NOAEL		
	Spotted Seatrout	None	NOAEL		
	Sandpiper	None	NOAEL		
	Green Heron	None	NOAEL		

Notes:

AET - apparent effects threshold

HQ - hazard quotient

LOAEL - lowest observable adverse effects level

NOAEL - no observable adverse effects level

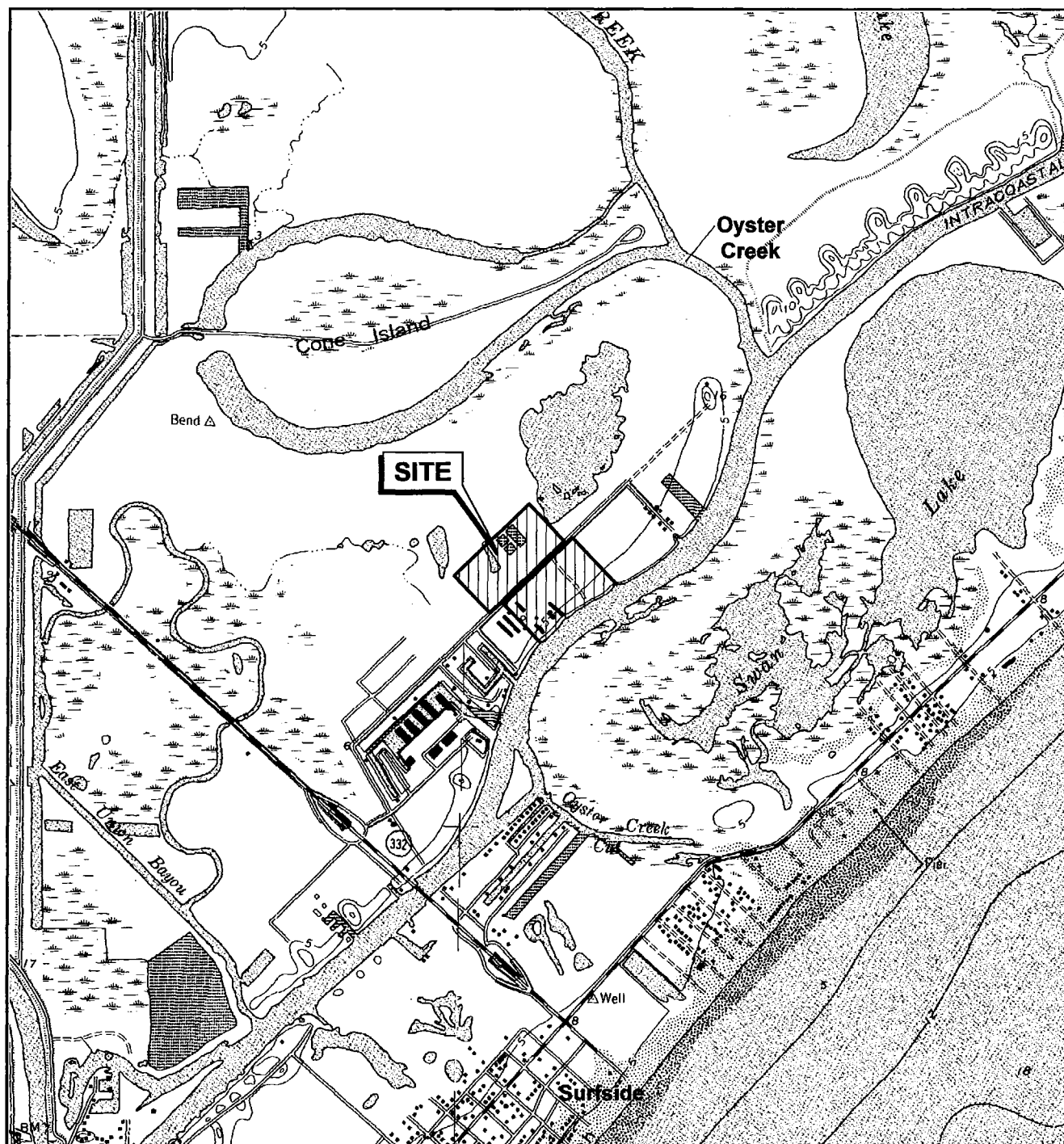
RME - reasonable maximum exposure

TABLE 27
SUMMARY OF SURFACE WATER DATA AND ECOLOGICAL BENCHMARKS

MEDIA	CHEMICAL OF POTENTIAL ECOLOGICAL CONCERN	MAX CONCENTRATION (mg/L)	ECO BENCHMARK (mg/L)	LC₅₀ (mg/L)*
Intracoastal Waterway Surface Water	Boron (dissolved)	4.99	1.2	86.5
Intracoastal Waterway Surface Water Background Area	Boron (dissolved)	4.33	1.2	86.5
	4,4'-DDT	0.000013	0.000001	0.00045
	Iron (dissolved)	0.06	0.05	4
	Silver (dissolved)	0.0058	0.00019	1.45
Wetland Area Surface Water	Acrolein	0.00929	0.005	0.43
	Boron (dissolved)	2.75	1.2	86.5
	Copper (dissolved)	0.011	0.0036	0.368
	Manganese (dissolved)	0.33	0.1	50
Pond Surface Water	Boron (dissolved)	3.33	1.2	86.5
	Manganese (dissolved)	1.06	0.1	50
	Silver (dissolved)	0.0029	0.00019	1.45

Notes:

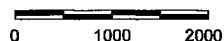
* Additional discussion related to the LC50 concentration provided here can be found in Section 3.4.8 of the SLERA report. All values from EPA, 2009.



QUADRANGLE LOCATION



Scale in Feet



GULFCO MARINE MAINTENANCE **FREEPORT, BRAZORIA COUNTY, TEXAS**

Figure 1

SITE LOCATION MAP

PROJECT: 1352

BY: ZGK

REVISIONS

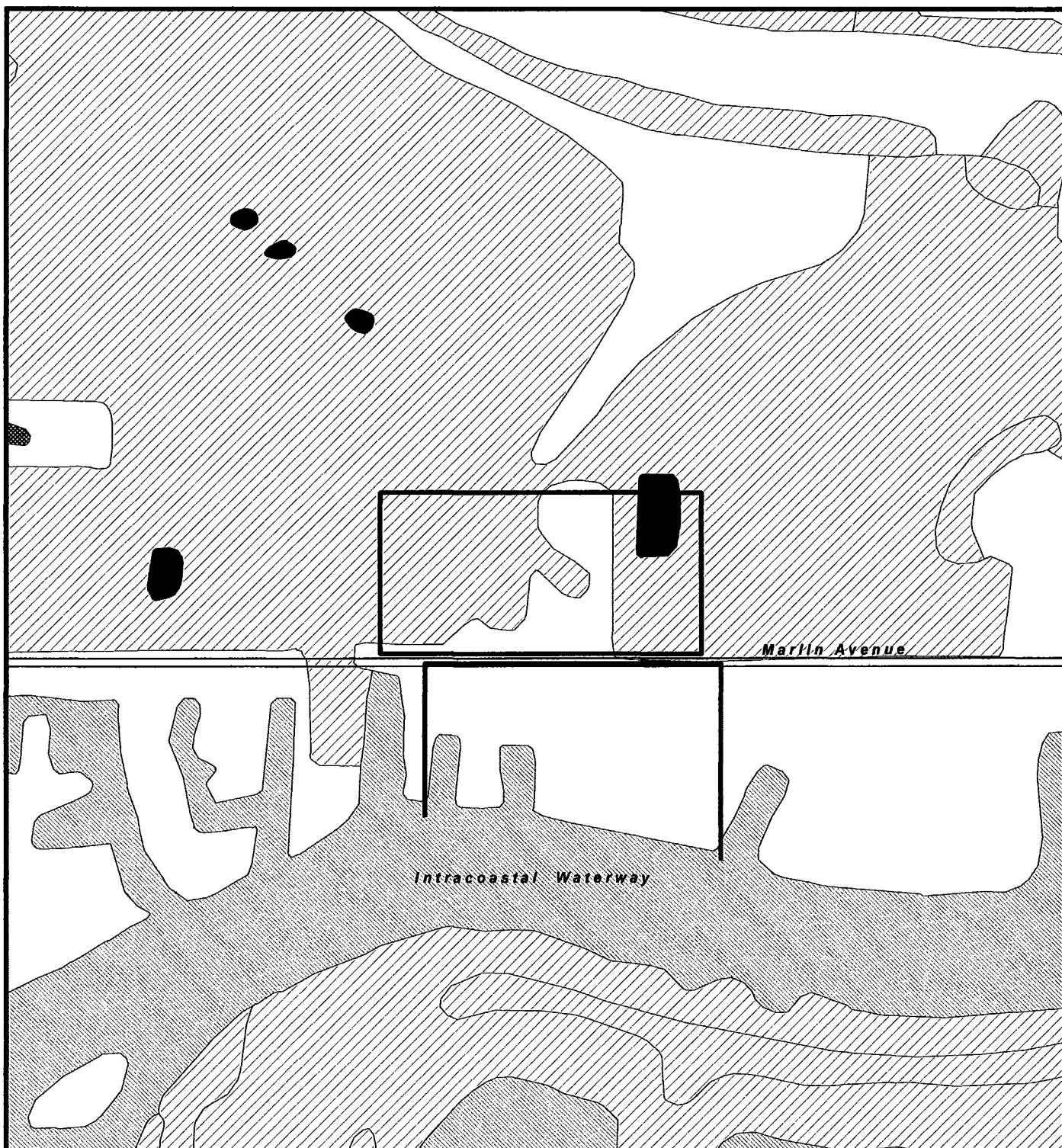
DATE: MAY, 2009

CHECKED: EFP

PASTOR, BEHLING & WHEELER, LLC
CONSULTING ENGINEERS AND SCIENTISTS

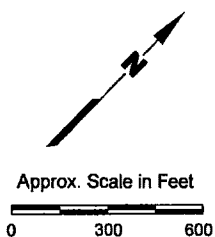
Source:

Base map taken from <http://www.tnris.state.tx.us> Freeport, Texas 7.5 min.
U.S.G.S. quadrangle, 1974.



EXPLANATION

- Approx. Site Boundary
- Upland Area
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Pond



Source:
U.S. Fish & Wildlife Service, Wetlands Online Mapper, 2008.

GULFCO MARINE MAINTENANCE FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 2 WETLAND MAP

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: EFP	

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Primary
Release
Mechanism(s)

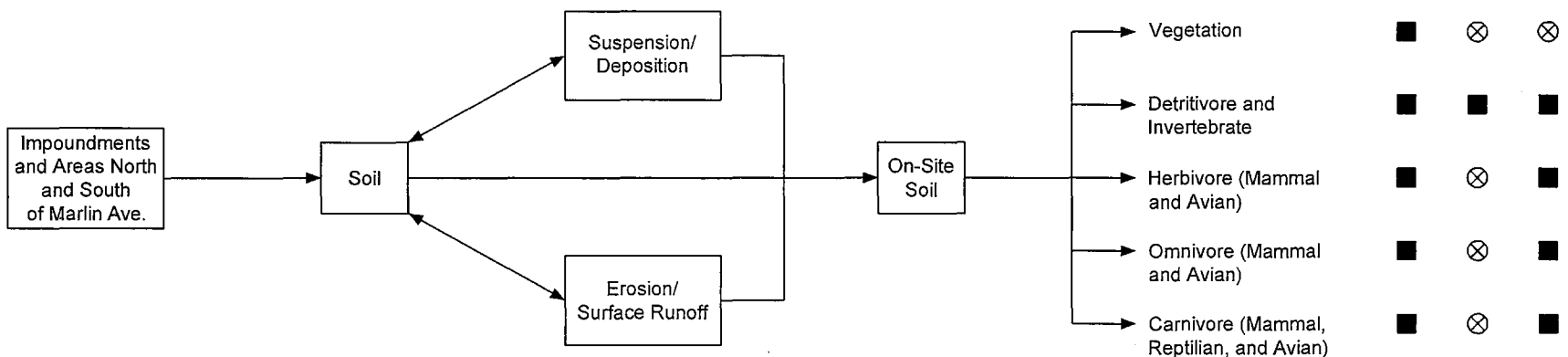
Secondary
Source

Secondary
Release
Mechanism(s)

Exposure
Medium

Potential
Receptors

Potential
Exposure Pathways



LEGEND

- Pathway is potentially complete
- ⊗ Pathway is incomplete
- ⊗ Pathway is not viable

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 4

**TERRESTRIAL ECOSYSTEM
CONCEPTUAL SITE MODEL**

PROJECT: 1352

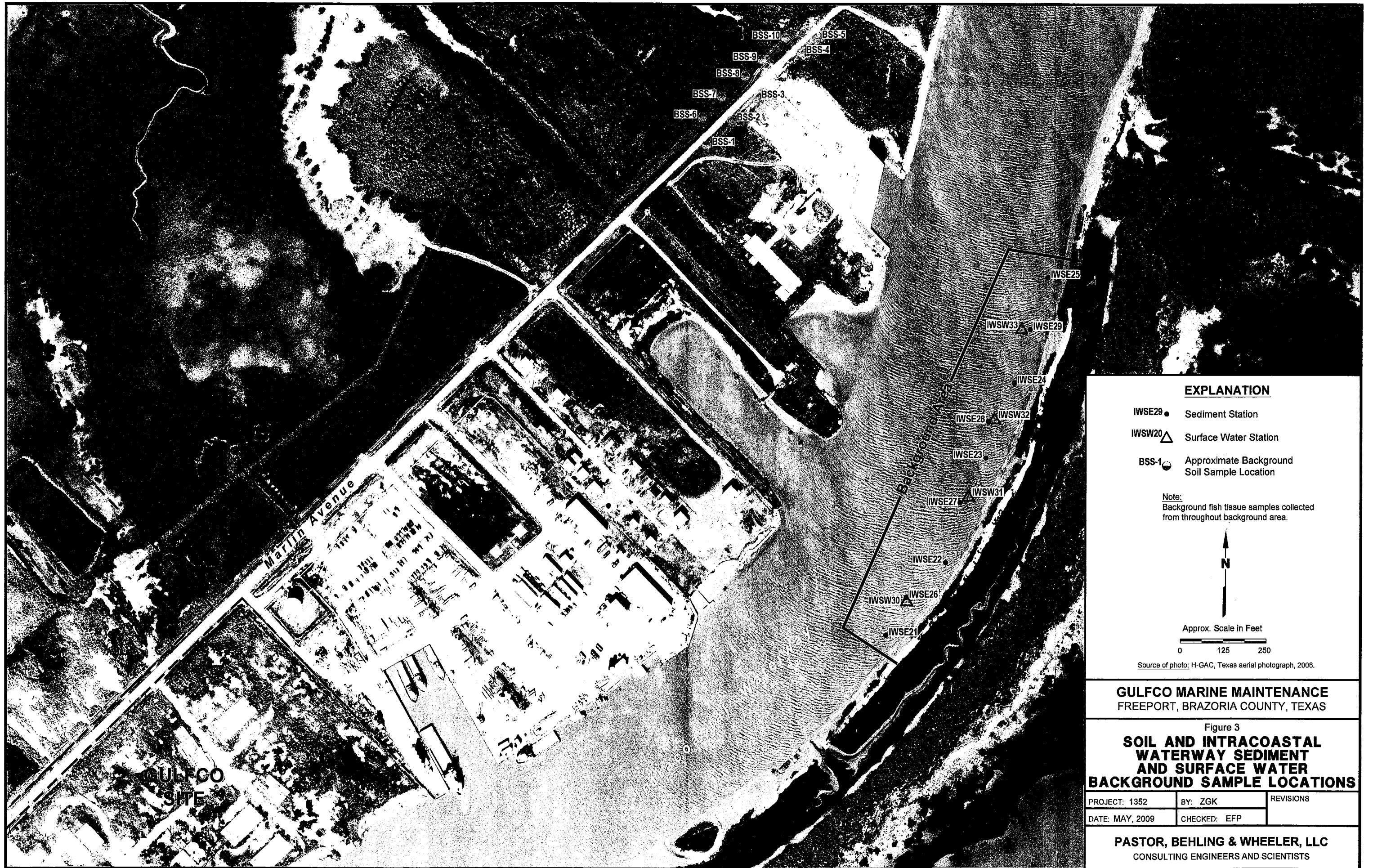
BY: ZGK

REVISIONS

DATE: MAY, 2009

CHECKED: KHT

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EXPLANATION

- IWSE29 ● Sediment Station
IWSW20 ▲ Surface Water Station
BSS-1 ● Approximate Background Soil Sample Location

Note:
Background fish tissue samples collected from throughout background area.



Approx. Scale in Feet

0 125 250

Source of photo: H-GAC, Texas aerial photograph, 2008.

GULFCO MARINE MAINTENANCE
FREEPORT, BRAZORIA COUNTY, TEXAS

Figure 3
**SOIL AND INTRACOASTAL
WATERWAY SEDIMENT
AND SURFACE WATER
BACKGROUND SAMPLE LOCATIONS**

PROJECT: 1352	BY: ZGK	REVISIONS
DATE: MAY, 2009	CHECKED: EFP	

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APPENDIX A
PRO UCL OUTPUT

APPENDIX A-1

SOUTH OF MARLIN SURFACE SOIL

[illegible]

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL		0.0784
Result or 1/2 SDL (4,4'-ddd)				
General Statistics				
Number of Valid Samples		83	Number of Unique Samples 55	
Raw Statistics		Log-transformed Statistics		
Minimum	1.1750E-4	Minimum of Log Data	-9.049	
Maximum	0.0243	Maximum of Log Data	-3.717	
Mean	7.8940E-4	Mean of log Data	-8.519	
Median	1.3300E-4	SD of log Data	1.087	
SD	0.0030			
Coefficient of Variation	3.894			
Skewness	6.54			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Lilliefors Test Statistic	0.435	Lilliefors Test Statistic	0.428	
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973	
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0013	95% H-UCL	4.7561E-4	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL 5.8317E-4		
95% Adjusted-CLT UCL	0.0016	97.5% Chebyshev (MVUE) UCL 6.8130E-4		
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL 8.7406E-4		
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.458	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0017			
nu star	76.06			
Approximate Chi Square Value (.05)	56.97	Nonparametric Statistics		
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0013	
Adjusted Chi Square Value	56.68	95% Jackknife UCL	0.0013	
		95% Standard Bootstrap UCL	0.0013	
Anderson-Darling Test Statistic	22.2	95% Bootstrap-t UCL	0.0031	
Anderson-Darling 5% Critical Value	0.827	95% Hall's Bootstrap UCL	0.0034	
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	0.0014	
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.0017	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0022	
		97.5% Chebyshev(Mean, Sd) UCL	0.0029	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0041	
95% Approximate Gamma UCL	0.0010			
95% Adjusted Gamma UCL	0.0010			
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL		0.0029
Result or 1/2 SDL (4,4'-dde)				

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	65
Raw Statistics		Log-transformed Statistics	
Minimum	1.6300E-4	Minimum of Log Data	-8.722
Maximum	0.0693	Maximum of Log Data	-2.669
Mean	0.0019	Mean of log Data	-7.87
Median	1.8900E-4	SD of log Data	1.305
SD	0.0080		
Coefficient of Variation	4.214		
Skewness	7.636		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.414	Lilliefors Test Statistic	0.358
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0033	95% H-UCL	0.0012
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0041	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0034	99% Chebyshev (MVUE) UCL	0.0025
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0047		
nu star	66.7		
Approximate Chi Square Value (.05)	48.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0033
Adjusted Chi Square Value	48.63	95% Jackknife UCL	0.0033
		95% Standard Bootstrap UCL	0.0033
Anderson-Darling Test Statistic	15.79	95% Bootstrap-t UCL	0.0083
Anderson-Darling 5% Critical Value	0.84	95% Hall's Bootstrap UCL	0.0083
Kolmogorov-Smirnov Test Statistic	0.364	95% Percentile Bootstrap UCL	0.0035
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.0046
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0057
		97.5% Chebyshev(Mean, Sd) UCL	0.0074
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0107
95% Approximate Gamma UCL	0.0026		
95% Adjusted Gamma UCL	0.0026		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0074
Result or 1/2 SDL (4,4'-ddt)			
General Statistics			
Number of Valid Samples	83	Number of Unique Samples	67
Raw Statistics		Log-transformed Statistics	
Minimum	6.2500E-5	Minimum of Log Data	-9.68

Maximum	0.0625	Maximum of Log Data	-2.773
Mean	0.0038	Mean of log Data	-7.704
Median	3.1700E-4	SD of log Data	2.095
SD	0.0092		
Coefficient of Variation	2.422		
Skewness	4.079		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.342	Lilliefors Test Statistic	0.255
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0055	95% H-UCL	0.0090
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0096
95% Adjusted-CLT UCL	0.006	97.5% Chebyshev (MVUE) UCL	0.0122
95% Modified-t UCL	0.0056	99% Chebyshev (MVUE) UCL	0.0173
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.315	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0122		
nu star	52.37		
Approximate Chi Square Value (.05)	36.75	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0055
Adjusted Chi Square Value	36.52	95% Jackknife UCL	0.0055
		95% Standard Bootstrap UCL	0.0055
Anderson-Darling Test Statistic	7.358	95% Bootstrap-t UCL	0.0063
Anderson-Darling 5% Critical Value	0.861	95% Hall's Bootstrap UCL	0.0066
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	0.0055
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0061
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0082
		97.5% Chebyshev(Mean, Sd) UCL	0.0102
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.014
95% Approximate Gamma UCL	0.0054		
95% Adjusted Gamma UCL	0.0055		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.014

Result or 1/2 SDL (acenaphthene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	67
Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.438
Maximum	1.69	Maximum of Log Data	0.525
Mean	0.0595	Mean of log Data	-4.288
Median	0.0051	SD of log Data	1.443
SD	0.2		
Coefficient of Variation	3.372		

Skewness		7.061		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Lilliefors Test Statistic	0.392		Lilliefors Test Statistic	0.328
Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL	0.0961		95% H-UCL	0.0597
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	
95% Adjusted-CLT UCL	0.114		97.5% Chebyshev (MVUE) UCL	0.0887
95% Modified-t UCL	0.0989		99% Chebyshev (MVUE) UCL	0.119
Gamma Distribution Test			Data Distribution	
k star (bias corrected)	0.434		Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.137			
nu star	72.06			
Approximate Chi Square Value (.05)	53.51		Nonparametric Statistics	
Adjusted Level of Significance	0.0471		95% CLT UCL	0.0956
Adjusted Chi Square Value	53.23		95% Jackknife UCL	0.0961
			95% Standard Bootstrap UCL	0.0952
Anderson-Darling Test Statistic	10.45		95% Bootstrap-t UCL	0.178
Anderson-Darling 5% Critical Value	0.832		95% Hall's Bootstrap UCL	0.236
Kolmogorov-Smirnov Test Statistic	0.313		95% Percentile Bootstrap UCL	0.0981
Kolmogorov-Smirnov 5% Critical Value	0.105		95% BCA Bootstrap UCL	0.119
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.155
			97.5% Chebyshev(Mean, Sd) UCL	0.197
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.278
95% Approximate Gamma UCL	0.0801			
95% Adjusted Gamma UCL	0.0805			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL	0.197
Result or 1/2 SDL (acenaphthylene)				
General Statistics				
Number of Valid Samples		83	Number of Unique Samples	
			46	
Raw Statistics			Log-transformed Statistics	
Minimum	0.0049		Minimum of Log Data	-5.312
Maximum	0.935		Maximum of Log Data	-0.0672
Mean	0.0382		Mean of log Data	-4.444
Median	0.0057		SD of log Data	1.267
SD	0.11			
Coefficient of Variation	2.876			
Skewness	6.947			
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Lilliefors Test Statistic	0.381		Lilliefors Test Statistic	0.384

Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0582	95% H-UCL	0.0372
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0459
95% Adjusted-CLT UCL	0.0678	97.5% Chebyshev (MVUE) UCL	0.0546
95% Modified-t UCL	0.0598	99% Chebyshev (MVUE) UCL	0.0717
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.522	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0731		
nu star	86.68		
Approximate Chi Square Value (.05)	66.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.058
Adjusted Chi Square Value	65.91	95% Jackknife UCL	0.0582
		95% Standard Bootstrap UCL	0.0584
Anderson-Darling Test Statistic	13.38	95% Bootstrap-t UCL	0.0853
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.132
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	0.0601
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0744
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0907
		97.5% Chebyshev(Mean, Sd) UCL	0.113
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.158
95% Approximate Gamma UCL	0.05		
95% Adjusted Gamma UCL	0.0502		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.113

Result or 1/2 SDL (aluminum)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	79
Raw Statistics		Log-transformed Statistics	
Minimum	414	Minimum of Log Data	6.026
Maximum	15200	Maximum of Log Data	9.629
Mean	5335	Mean of log Data	8.345
Median	4650	SD of log Data	0.757
SD	3345		
Coefficient of Variation	0.627		
Skewness	0.744		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0927	Lilliefors Test Statistic	0.088
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5946	95% H-UCL	6635

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		7839
95% Adjusted-CLT UCL	5971	97.5% Chebyshev (MVUE) UCL		8817
95% Modified-t UCL	5951	99% Chebyshev (MVUE) UCL		10737
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	2.187	Data appear Normal at 5% Significance Level		
Theta Star	2439			
nu star	363.1			
Approximate Chi Square Value (.05)	320	Nonparametric Statistics		
Adjusted Level of Significance	0.0471	95% CLT UCL		5939
Adjusted Chi Square Value	319.2	95% Jackknife UCL		5946
		95% Standard Bootstrap UCL		5930
Anderson-Darling Test Statistic	0.468	95% Bootstrap-t UCL		5983
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL		5976
Kolmogorov-Smirnov Test Statistic	0.074	95% Percentile Bootstrap UCL		5953
Kolmogorov-Smirnov 5% Critical Value	0.0992	95% BCA Bootstrap UCL		5953
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		6936
		97.5% Chebyshev(Mean, Sd) UCL		7628
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		8989
95% Approximate Gamma UCL	6055			
95% Adjusted Gamma UCL	6068			
Potential UCL to Use		Use 95% Student's-t UCL		5946

Result or 1/2 SDL (anthracene)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		63
Raw Statistics			Log-transformed Statistics		
Minimum		0.0049	Minimum of Log Data		-5.316
Maximum		2.46	Maximum of Log Data		0.9
Mean		0.0961	Mean of log Data		-3.855
Median		0.0112	SD of log Data		1.589
SD		0.293			
Coefficient of Variation		3.053			
Skewness		6.861			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.378	Lilliefors Test Statistic		0.25
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.15	95% H-UCL		0.123
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.15
95% Adjusted-CLT UCL		0.175	97.5% Chebyshev (MVUE) UCL		0.183
95% Modified-t UCL		0.154	99% Chebyshev (MVUE) UCL		0.249
Gamma Distribution Test			Data Distribution		

k star (bias corrected)	0.422	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.227		
nu star	70.13		
Approximate Chi Square Value (.05)	51.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.149
Adjusted Chi Square Value	51.57	95% Jackknife UCL	0.15
		95% Standard Bootstrap UCL	0.15
Anderson-Darling Test Statistic	7.484	95% Bootstrap-t UCL	0.244
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.369
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	0.155
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.19
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.236
		97.5% Chebyshev(Mean, Sd) UCL	0.297
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.416
95% Approximate Gamma UCL	0.13		
95% Adjusted Gamma UCL	0.131		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.297

Result or 1/2 SDL (antimony)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	49
Raw Statistics		Log-transformed Statistics	
Minimum	0.095	Minimum of Log Data	-2.354
Maximum	5.14	Maximum of Log Data	1.637
Mean	1.118	Mean of log Data	-0.619
Median	0.23	SD of log Data	1.266
SD	1.228		
Coefficient of Variation	1.099		
Skewness	1.098		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.307	Lilliefors Test Statistic	0.281
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.342	95% H-UCL	1.703
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.102
95% Adjusted-CLT UCL	1.357	97.5% Chebyshev (MVUE) UCL	2.5
95% Modified-t UCL	1.345	99% Chebyshev (MVUE) UCL	3.283
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.79	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.414		
nu star	131.2		
Approximate Chi Square Value (.05)	105.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	1.339

Adjusted Chi Square Value	105.3	95% Jackknife UCL	1.342
		95% Standard Bootstrap UCL	1.334
Anderson-Darling Test Statistic	6.492	95% Bootstrap-t UCL	1.364
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	1.357
Kolmogorov-Smirnov Test Statistic	0.302	95% Percentile Bootstrap UCL	1.349
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	1.365
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.705
		97.5% Chebyshev(Mean, Sd) UCL	1.959
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.459
95% Approximate Gamma UCL	1.387		
95% Adjusted Gamma UCL	1.392		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.959

Result or 1/2 SDL (aroclor-1254)

General Statistics			
Number of Valid Samples	86	Number of Unique Samples	63
Raw Statistics		Log-transformed Statistics	
Minimum	0.0016	Minimum of Log Data	-6.422
Maximum	7.98	Maximum of Log Data	2.077
Mean	0.137	Mean of log Data	-5.526
Median	0.0018	SD of log Data	1.783
SD	0.875		
Coefficient of Variation	6.368		
Skewness	8.719		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.446	Lilliefors Test Statistic	0.425
Lilliefors Critical Value	0.0955	Lilliefors Critical Value	0.0955
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.294	95% H-UCL	0.0354
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0417
95% Adjusted-CLT UCL	0.387	97.5% Chebyshev (MVUE) UCL	0.0517
95% Modified-t UCL	0.309	99% Chebyshev (MVUE) UCL	0.0714
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.207	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.663		
nu star	35.66		
Approximate Chi Square Value (.05)	22.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0472	95% CLT UCL	0.293
Adjusted Chi Square Value	22.82	95% Jackknife UCL	0.294
		95% Standard Bootstrap UCL	0.294
Anderson-Darling Test Statistic	23.56	95% Bootstrap-t UCL	1.17
Anderson-Darling 5% Critical Value	0.908	95% Hall's Bootstrap UCL	0.859
Kolmogorov-Smirnov Test Statistic	0.451	95% Percentile Bootstrap UCL	0.323

Kolmogorov-Smirnov 5% Critical Value	0.107	95% BCA Bootstrap UCL	0.45
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.548
		97.5% Chebyshev(Mean, Sd) UCL	0.726
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.076
95% Approximate Gamma UCL	0.213		
95% Adjusted Gamma UCL	0.215		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.726
Result or 1/2 SDL (arsenic)			
General Statistics			
Number of Valid Samples	83	Number of Unique Samples	78
Raw Statistics		Log-transformed Statistics	
Minimum	0.085	Minimum of Log Data	-2.465
Maximum	24.3	Maximum of Log Data	3.19
Mean	3.735	Mean of log Data	0.735
Median	2.49	SD of log Data	1.257
SD	4.012		
Coefficient of Variation	1.074		
Skewness	2.522		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.186	Lilliefors Test Statistic	0.128
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.467	95% H-UCL	6.497
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.02
95% Adjusted-CLT UCL	4.589	97.5% Chebyshev (MVUE) UCL	9.533
95% Modified-t UCL	4.488	99% Chebyshev (MVUE) UCL	12.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.964	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.873		
nu star	160.1		
Approximate Chi Square Value (.05)	131.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	4.459
Adjusted Chi Square Value	131.4	95% Jackknife UCL	4.467
		95% Standard Bootstrap UCL	4.439
Anderson-Darling Test Statistic	0.324	95% Bootstrap-t UCL	4.598
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	4.764
Kolmogorov-Smirnov Test Statistic	0.061	95% Percentile Bootstrap UCL	4.487
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	4.531
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.654
		97.5% Chebyshev(Mean, Sd) UCL	6.485
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.116
95% Approximate Gamma UCL	4.535		

95% Adjusted Gamma UCL	4.551		
Potential UCL to Use		Use 95% Approximate Gamma UCL	4.535

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	79
Raw Statistics		Log-transformed Statistics	
Minimum	18.6	Minimum of Log Data	2.923
Maximum	2180	Maximum of Log Data	7.687
Mean	345.2	Mean of log Data	5.482
Median	206	SD of log Data	0.84
SD	349		
Coefficient of Variation	1.011		
Skewness	2.74		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.199	Lilliefors Test Statistic	0.096
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	408.9	95% H-UCL	415.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	496.4
95% Adjusted-CLT UCL	420.5	97.5% Chebyshev (MVUE) UCL	564
95% Modified-t UCL	410.9	99% Chebyshev (MVUE) UCL	696.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.478	Data appear Lognormal at 5% Significance Level	
Theta Star	233.6		
nu star	245.3		
Approximate Chi Square Value (.05)	210	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	408.2
Adjusted Chi Square Value	209.5	95% Jackknife UCL	408.9
		95% Standard Bootstrap UCL	409.3
Anderson-Darling Test Statistic	2.05	95% Bootstrap-t UCL	434.7
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	439
Kolmogorov-Smirnov Test Statistic	0.146	95% Percentile Bootstrap UCL	412.1
Kolmogorov-Smirnov 5% Critical Value	0.0998	95% BCA Bootstrap UCL	421.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	512.2
		97.5% Chebyshev(Mean, Sd) UCL	584.4
		99% Chebyshev(Mean, Sd) UCL	726.4
Assuming Gamma Distribution			
95% Approximate Gamma UCL	403.2		
95% Adjusted Gamma UCL	404.3		
Potential UCL to Use		Use 95% H-UCL	415.1

Result or 1/2 SDL (benzo(a)anthracene)					
General Statistics					
Number of Valid Samples		83	Number of Unique Samples		70
Raw Statistics			Log-transformed Statistics		
Minimum		0.0044	Minimum of Log Data		-5.415
Maximum		5.02	Maximum of Log Data		1.613
Mean		0.345	Mean of log Data		-3.502
Median		0.0053	SD of log Data		2.25
SD		0.793			
Coefficient of Variation		2.297			
Skewness		3.493			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.364	Lilliefors Test Statistic		0.285
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.49	95% H-UCL		0.941
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.942
95% Adjusted-CLT UCL		0.524	97.5% Chebyshev (MVUE) UCL		1.202
95% Modified-t UCL		0.495	99% Chebyshev (MVUE) UCL		1.712
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.283	Data do not follow a Discernable Distribution (0.05)		
Theta Star		1.22			
nu star		46.96			
Approximate Chi Square Value (.05)		32.23	Nonparametric Statistics		
Adjusted Level of Significance		0.0471	95% CLT UCL		0.488
Adjusted Chi Square Value		32.02	95% Jackknife UCL		0.49
			95% Standard Bootstrap UCL		0.486
Anderson-Darling Test Statistic		9.314	95% Bootstrap-t UCL		0.547
Anderson-Darling 5% Critical Value		0.872	95% Hall's Bootstrap UCL		0.565
Kolmogorov-Smirnov Test Statistic		0.281	95% Percentile Bootstrap UCL		0.506
Kolmogorov-Smirnov 5% Critical Value		0.107	95% BCA Bootstrap UCL		0.532
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.724
			97.5% Chebyshev(Mean, Sd) UCL		0.888
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1.211
95% Approximate Gamma UCL		0.503			
95% Adjusted Gamma UCL		0.506			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		1.211
Result or 1/2 SDL (benzo(a)pyrene)					
General Statistics					
Number of Valid Samples		83	Number of Unique Samples		80

Raw Statistics			Log-transformed Statistics		
	Minimum	0.0044		Minimum of Log Data	-5.419
	Maximum	4.57		Maximum of Log Data	1.52
	Mean	0.452		Mean of log Data	-2.692
	Median	0.0514		SD of log Data	2.07
	SD	0.92			
	Coefficient of Variation	2.036			
	Skewness	2.73			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.329		Lilliefors Test Statistic	0.106
	Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.62		95% H-UCL	1.269
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	1.37
	95% Adjusted-CLT UCL	0.651		97.5% Chebyshev (MVUE) UCL	1.731
	95% Modified-t UCL	0.625		99% Chebyshev (MVUE) UCL	2.44
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.349	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	1.296			
	nu star	57.92			
	Approximate Chi Square Value (.05)	41.43	Nonparametric Statistics		
	Adjusted Level of Significance	0.0471		95% CLT UCL	0.618
	Adjusted Chi Square Value	41.18		95% Jackknife UCL	0.62
				95% Standard Bootstrap UCL	0.621
	Anderson-Darling Test Statistic	4.332		95% Bootstrap-t UCL	0.692
	Anderson-Darling 5% Critical Value	0.853		95% Hall's Bootstrap UCL	0.646
	Kolmogorov-Smirnov Test Statistic	0.213		95% Percentile Bootstrap UCL	0.622
	Kolmogorov-Smirnov 5% Critical Value	0.106		95% BCA Bootstrap UCL	0.651
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.892
Assuming Gamma Distribution				97.5% Chebyshev(Mean, Sd) UCL	1.083
	95% Approximate Gamma UCL	0.632		99% Chebyshev(Mean, Sd) UCL	1.457
	95% Adjusted Gamma UCL	0.636			
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL	1.457

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		79
Raw Statistics			Log-transformed Statistics		
Minimum		0.0033	Minimum of Log Data		-5.688
Maximum		5.42	Maximum of Log Data		1.69
Mean		0.582	Mean of log Data		-2.042
Median		0.113	SD of log Data		1.921

SD	1.074		
Coefficient of Variation	1.846		
Skewness	2.709		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.314	Lilliefors Test Statistic	0.0761
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.778	95% H-UCL	1.638
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.857
95% Adjusted-CLT UCL	0.813	97.5% Chebyshev (MVUE) UCL	2.326
95% Modified-t UCL	0.784	99% Chebyshev (MVUE) UCL	3.247
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.425	Data appear Lognormal at 5% Significance Level	
Theta Star	1.369		
nu star	70.59		
Approximate Chi Square Value (.05)	52.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.776
Adjusted Chi Square Value	51.97	95% Jackknife UCL	0.778
		95% Standard Bootstrap UCL	0.771
Anderson-Darling Test Statistic	2.74	95% Bootstrap-t UCL	0.839
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.821
Kolmogorov-Smirnov Test Statistic	0.166	95% Percentile Bootstrap UCL	0.79
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.827
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.096
		97.5% Chebyshev(Mean, Sd) UCL	1.318
		99% Chebyshev(Mean, Sd) UCL	1.755
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.786		
95% Adjusted Gamma UCL	0.79		
Potential UCL to Use		Use 95% H-UCL	1.638

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples		83	Number of Unique Samples		73
Raw Statistics			Log-transformed Statistics		
Minimum	0.0044		Minimum of Log Data	-5.418	
Maximum	4.24		Maximum of Log Data	1.445	
Mean	0.324		Mean of log Data	-2.987	
Median	0.0493		SD of log Data	2.033	
SD	0.706				
Coefficient of Variation	2.182				
Skewness	3.466				

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Lilliefors Test Statistic		0.326		Lilliefors Test Statistic		0.179	
Lilliefors Critical Value		0.0973		Lilliefors Critical Value		0.0973	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.452		95% H-UCL		0.854	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.934	
95% Adjusted-CLT UCL		0.483		97.5% Chebyshev (MVUE) UCL		1.178	
95% Modified-t UCL		0.457		99% Chebyshev (MVUE) UCL		1.657	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.355		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.911					
nu star		58.96					
Approximate Chi Square Value (.05)		42.3		Nonparametric Statistics			
Adjusted Level of Significance		0.0471		95% CLT UCL		0.451	
Adjusted Chi Square Value		42.05		95% Jackknife UCL		0.452	
				95% Standard Bootstrap UCL		0.449	
Anderson-Darling Test Statistic		4.478		95% Bootstrap-t UCL		0.498	
Anderson-Darling 5% Critical Value		0.852		95% Hall's Bootstrap UCL		0.504	
Kolmogorov-Smirnov Test Statistic		0.172		95% Percentile Bootstrap UCL		0.453	
Kolmogorov-Smirnov 5% Critical Value		0.106		95% BCA Bootstrap UCL		0.499	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.661	
				97.5% Chebyshev(Mean, Sd) UCL		0.807	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		1.095	
95% Approximate Gamma UCL		0.451					
95% Adjusted Gamma UCL		0.454					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		1.095	

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics			
Number of Valid Samples		83	
Number of Unique Samples		59	
Raw Statistics		Log-transformed Statistics	
Minimum	0.0068	Minimum of Log Data	-4.984
Maximum	4.25	Maximum of Log Data	1.447
Mean	0.24	Mean of log Data	-3.413
Median	0.0081	SD of log Data	1.887
SD	0.601		
Coefficient of Variation	2.507		
Skewness	4.388		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic		Lilliefors Test Statistic	0.3
Lilliefors Critical Value		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.349		95% H-UCL	0.381	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.437	
95% Adjusted-CLT UCL	0.382		97.5% Chebyshev (MVUE) UCL	0.546	
95% Modified-t UCL	0.355		99% Chebyshev (MVUE) UCL	0.76	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.336		Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.713				
nu star	55.81				
Approximate Chi Square Value (.05)	39.64		Nonparametric Statistics		
Adjusted Level of Significance	0.0471		95% CLT UCL	0.348	
Adjusted Chi Square Value	39.4		95% Jackknife UCL	0.349	
			95% Standard Bootstrap UCL	0.348	
Anderson-Darling Test Statistic	9.793		95% Bootstrap-t UCL	0.407	
Anderson-Darling 5% Critical Value	0.856		95% Hall's Bootstrap UCL	0.464	
Kolmogorov-Smirnov Test Statistic	0.285		95% Percentile Bootstrap UCL	0.356	
Kolmogorov-Smirnov 5% Critical Value	0.106		95% BCA Bootstrap UCL	0.389	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.527	
			97.5% Chebyshev(Mean, Sd) UCL	0.651	
			99% Chebyshev(Mean, Sd) UCL	0.896	
Assuming Gamma Distribution					
95% Approximate Gamma UCL	0.337				
95% Adjusted Gamma UCL	0.339				
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL	0.651	

Result or 1/2 SDL (beryllium)

General Statistics					
Number of Valid Samples	83		Number of Unique Samples	60	
Raw Statistics			Log-transformed Statistics		
Minimum	0.0015		Minimum of Log Data	-6.47	
Maximum	4.6		Maximum of Log Data	1.526	
Mean	0.408		Mean of log Data	-1.368	
Median	0.32		SD of log Data	1.136	
SD	0.525				
Coefficient of Variation	1.287				
Skewness	6.344				

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic	0.22		Lilliefors Test Statistic	0.159	
Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.504		95% H-UCL	0.653	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.803	
95% Adjusted-CLT UCL	0.546		97.5% Chebyshev (MVUE) UCL	0.943	
95% Modified-t UCL	0.511		99% Chebyshev (MVUE) UCL	1.218	

Gamma Distribution Test					Data Distribution						
k star (bias corrected)		1.163	Data Follow Appr. Gamma Distribution at 5% Significance Level								
Theta Star		0.351									
nu star		193.1									
Approximate Chi Square Value (.05)		162	Nonparametric Statistics								
Adjusted Level of Significance		0.0471	95% CLT UCL					0.503			
Adjusted Chi Square Value		161.5	95% Jackknife UCL					0.504			
			95% Standard Bootstrap UCL					0.502			
Anderson-Darling Test Statistic		0.998	95% Bootstrap-t UCL					0.59			
Anderson-Darling 5% Critical Value		0.778	95% Hall's Bootstrap UCL					0.909			
Kolmogorov-Smirnov Test Statistic		0.096	95% Percentile Bootstrap UCL					0.512			
Kolmogorov-Smirnov 5% Critical Value		0.101	95% BCA Bootstrap UCL					0.577			
Data follow Appr. Gamma Distribution at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL					0.659			
			97.5% Chebyshev(Mean, Sd) UCL					0.768			
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL					0.982			
95% Approximate Gamma UCL		0.487									
95% Adjusted Gamma UCL		0.488									
Potential UCL to Use			Use 95% Approximate Gamma UCL					0.487			

Result or 1/2 SDL (biphenyl)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	44
Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.318
Maximum	0.0807	Maximum of Log Data	-2.517
Mean	0.015	Mean of log Data	-4.739
Median	0.0056	SD of log Data	0.899
SD	0.0197		
Coefficient of Variation	1.313		
Skewness	1.973		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.433	Lilliefors Test Statistic	0.415
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0186	95% H-UCL	0.0162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0195
95% Adjusted-CLT UCL	0.019	97.5% Chebyshev (MVUE) UCL	0.0223
95% Modified-t UCL	0.0186	99% Chebyshev (MVUE) UCL	0.0279
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.035	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0145		
nu star	171.9		

Approximate Chi Square Value (.05)	142.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0185
Adjusted Chi Square Value	142.1	95% Jackknife UCL	0.0186
		95% Standard Bootstrap UCL	0.0185
Anderson-Darling Test Statistic	16.91	95% Bootstrap-t UCL	0.0193
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.0188
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	0.0186
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0191
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0244
		97.5% Chebyshev(Mean, Sd) UCL	0.0285
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0365
95% Approximate Gamma UCL	0.0181		
95% Adjusted Gamma UCL	0.0181		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0244

Result or 1/2 SDL (boron)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	63
Raw Statistics		Log-transformed Statistics	
Minimum	0.475	Minimum of Log Data	-0.744
Maximum	54.4	Maximum of Log Data	3.996
Mean	4.662	Mean of log Data	0.66
Median	1.07	SD of log Data	1.351
SD	7.296		
Coefficient of Variation	1.565		
Skewness	4.319		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.283	Lilliefors Test Statistic	0.261
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.994	95% H-UCL	7.093
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.751
95% Adjusted-CLT UCL	6.384	97.5% Chebyshev (MVUE) UCL	10.49
95% Modified-t UCL	6.057	99% Chebyshev (MVUE) UCL	13.92
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.672	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.938		
nu star	111.5		
Approximate Chi Square Value (.05)	88.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	5.979
Adjusted Chi Square Value	87.78	95% Jackknife UCL	5.994
		95% Standard Bootstrap UCL	6.015
Anderson-Darling Test Statistic	5.465	95% Bootstrap-t UCL	6.686

Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	12.01
Kolmogorov-Smirnov Test Statistic	0.251	95% Percentile Bootstrap UCL	6.051
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	6.577
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.152
		97.5% Chebyshev(Mean, Sd) UCL	9.663
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.63
95% Approximate Gamma UCL	5.898		
95% Adjusted Gamma UCL	5.922		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	9.663

Result or 1/2 SDL (butyl benzyl phthalate)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	45
Raw Statistics		Log-transformed Statistics	
Minimum	0.0054	Minimum of Log Data	-5.212
Maximum	0.297	Maximum of Log Data	-1.214
Mean	0.0187	Mean of log Data	-4.645
Median	0.0062	SD of log Data	0.914
SD	0.0388		
Coefficient of Variation	2.069		
Skewness	5.405		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.381	Lilliefors Test Statistic	0.407
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0258	95% H-UCL	0.0181
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0219
95% Adjusted-CLT UCL	0.0284	97.5% Chebyshev (MVUE) UCL	0.0251
95% Modified-t UCL	0.0262	99% Chebyshev (MVUE) UCL	0.0314

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.854	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0219		
nu star	141.8		
Approximate Chi Square Value (.05)	115.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0257
Adjusted Chi Square Value	114.9	95% Jackknife UCL	0.0258
		95% Standard Bootstrap UCL	0.0257
Anderson-Darling Test Statistic	16.12	95% Bootstrap-t UCL	0.0343
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	0.0581
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0265
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0297
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0373
		97.5% Chebyshev(Mean, Sd) UCL	0.0453

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.0611
95% Approximate Gamma UCL	0.0231			
95% Adjusted Gamma UCL	0.0231			
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL		0.0373

Result or 1/2 SDL (cadmium)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		47
Raw Statistics			Log-transformed Statistics		
Minimum		0.0085	Minimum of Log Data		-4.768
Maximum		9.71	Maximum of Log Data		2.273
Mean		0.464	Mean of log Data		-2.309
Median		0.23	SD of log Data		2.023
SD		1.141			
Coefficient of Variation		2.458			
Skewness		6.868			

Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Lilliefors Test Statistic	0.345		Lilliefors Test Statistic	0.221
Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL	0.672		95% H-UCL	1.636
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	1.796
95% Adjusted-CLT UCL	0.771		97.5% Chebyshev (MVUE) UCL	2.263
95% Modified-t UCL	0.688		99% Chebyshev (MVUE) UCL	3.181
Gamma Distribution Test			Data Distribution	
k star (bias corrected)	0.416		Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.116			
nu star	69.03			
Approximate Chi Square Value (.05)	50.91		Nonparametric Statistics	
Adjusted Level of Significance	0.0471		95% CLT UCL	0.67
Adjusted Chi Square Value	50.63		95% Jackknife UCL	0.672
			95% Standard Bootstrap UCL	0.665
Anderson-Darling Test Statistic	3.831		95% Bootstrap-t UCL	1.001
Anderson-Darling 5% Critical Value	0.837		95% Hall's Bootstrap UCL	1.548
Kolmogorov-Smirnov Test Statistic	0.195		95% Percentile Bootstrap UCL	0.696
Kolmogorov-Smirnov 5% Critical Value	0.105		95% BCA Bootstrap UCL	0.822
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	1.01
			97.5% Chebyshev(Mean, Sd) UCL	1.246
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	1.71
95% Approximate Gamma UCL	0.629			
95% Adjusted Gamma UCL	0.633			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	1.71

Result or 1/2 SDL (carbazole)			
General Statistics			
Number of Valid Samples	83	Number of Unique Samples	68
Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.444
Maximum	1.54	Maximum of Log Data	0.432
Mean	0.0612	Mean of log Data	-4.243
Median	0.0051	SD of log Data	1.457
SD	0.192		
Coefficient of Variation	3.132		
Skewness	6.428		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.383	Lilliefors Test Statistic	0.302
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0962	95% H-UCL	0.0641
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0787
95% Adjusted-CLT UCL	0.112	97.5% Chebyshev (MVUE) UCL	0.0953
95% Modified-t UCL	0.0987	99% Chebyshev (MVUE) UCL	0.128
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.438	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.14		
nu star	72.73		
Approximate Chi Square Value (.05)	54.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0958
Adjusted Chi Square Value	53.81	95% Jackknife UCL	0.0962
		95% Standard Bootstrap UCL	0.0954
Anderson-Darling Test Statistic	9.829	95% Bootstrap-t UCL	0.171
Anderson-Darling 5% Critical Value	0.831	95% Hall's Bootstrap UCL	0.246
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	0.0994
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.123
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.153
		97.5% Chebyshev(Mean, Sd) UCL	0.193
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.27
95% Approximate Gamma UCL	0.0823		
95% Adjusted Gamma UCL	0.0827		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.193
Result or 1/2 SDL (chromium)			
General Statistics			

Number of Valid Samples			83	Number of Unique Samples			75
Raw Statistics				Log-transformed Statistics			
	Minimum	3.37			Minimum of Log Data	1.215	
	Maximum	136			Maximum of Log Data	4.913	
	Mean	16.08			Mean of log Data	2.58	
	Median	12.6			SD of log Data	0.568	
	SD	15.7					
	Coefficient of Variation	0.977					
	Skewness	5.833					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
	Lilliefors Test Statistic	0.227			Lilliefors Test Statistic	0.0598	
	Lilliefors Critical Value	0.0973			Lilliefors Critical Value	0.0973	
Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
	95% Student's-t UCL	18.94			95% H-UCL	17.45	
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	19.97	
	95% Adjusted-CLT UCL	20.09			97.5% Chebyshev (MVUE) UCL	21.91	
	95% Modified-t UCL	19.13			99% Chebyshev (MVUE) UCL	25.74	
Gamma Distribution Test				Data Distribution			
	k star (bias corrected)	2.597		Data appear Lognormal at 5% Significance Level			
	Theta Star	6.19					
	nu star	431.1					
	Approximate Chi Square Value (.05)	384		Nonparametric Statistics			
	Adjusted Level of Significance	0.0471			95% CLT UCL	18.91	
	Adjusted Chi Square Value	383.2			95% Jackknife UCL	18.94	
					95% Standard Bootstrap UCL	18.82	
	Anderson-Darling Test Statistic	2.059			95% Bootstrap-t UCL	21.55	
	Anderson-Darling 5% Critical Value	0.76			95% Hall's Bootstrap UCL	31.63	
	Kolmogorov-Smirnov Test Statistic	0.113			95% Percentile Bootstrap UCL	19.12	
	Kolmogorov-Smirnov 5% Critical Value	0.099			95% BCA Bootstrap UCL	20.49	
Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL	23.59	
					97.5% Chebyshev(Mean, Sd) UCL	26.84	
Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL	33.22	
	95% Approximate Gamma UCL	18.05					
	95% Adjusted Gamma UCL	18.09					
Potential UCL to Use					Use 95% H-UCL	17.45	

Result or 1/2 SDL (chrysene)

General Statistics							
Number of Valid Samples			83	Number of Unique Samples			82
Raw Statistics				Log-transformed Statistics			
	Minimum	0.0042			Minimum of Log Data	-5.47	
	Maximum	4.87			Maximum of Log Data	1.583	

Mean	0.409	Mean of log Data	-2.736
Median	0.0493	SD of log Data	2.052
SD	0.836		
Coefficient of Variation	2.044		
Skewness	3.079		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.322	Lilliefors Test Statistic	0.0982
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.562	95% H-UCL	1.156
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.256
95% Adjusted-CLT UCL	0.593	97.5% Chebyshev (MVUE) UCL	1.586
95% Modified-t UCL	0.567	99% Chebyshev (MVUE) UCL	2.233
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.142		
nu star	59.42		
Approximate Chi Square Value (.05)	42.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.56
Adjusted Chi Square Value	42.45	95% Jackknife UCL	0.562
		95% Standard Bootstrap UCL	0.557
Anderson-Darling Test Statistic	3.941	95% Bootstrap-t UCL	0.617
Anderson-Darling 5% Critical Value	0.851	95% Hall's Bootstrap UCL	0.604
Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	0.57
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.607
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.809
		97.5% Chebyshev(Mean, Sd) UCL	0.982
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.322
95% Approximate Gamma UCL	0.569		
95% Adjusted Gamma UCL	0.572		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.322

Result or 1/2 SDL (cobalt)

General Statistics

Number of Valid Samples		83	Number of Unique Samples		79
Raw Statistics			Log-transformed Statistics		
Minimum	0.0125		Minimum of Log Data	-4.382	
Maximum	16		Maximum of Log Data	2.773	
Mean	3.705		Mean of log Data	1.069	
Median	3.49		SD of log Data	0.946	
SD	2.249				
Coefficient of Variation	0.607				
Skewness	2.18				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.107	Lilliefors Test Statistic	0.182
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.116	95% H-UCL	5.716
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.921
95% Adjusted-CLT UCL	4.175	97.5% Chebyshev (MVUE) UCL	7.962
95% Modified-t UCL	4.126	99% Chebyshev (MVUE) UCL	10
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.153	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.721		
nu star	357.5		
Approximate Chi Square Value (.05)	314.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	4.111
Adjusted Chi Square Value	313.9	95% Jackknife UCL	4.116
		95% Standard Bootstrap UCL	4.118
Anderson-Darling Test Statistic	1.75	95% Bootstrap-t UCL	4.185
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	4.256
Kolmogorov-Smirnov Test Statistic	0.112	95% Percentile Bootstrap UCL	4.137
Kolmogorov-Smirnov 5% Critical Value	0.0993	95% BCA Bootstrap UCL	4.198
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.781
		97.5% Chebyshev(Mean, Sd) UCL	5.247
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.161
95% Approximate Gamma UCL	4.21		
95% Adjusted Gamma UCL	4.219		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	4.781

Result or 1/2 SDL (copper)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	78
Raw Statistics		Log-transformed Statistics	
Minimum	1.55	Minimum of Log Data	0.438
Maximum	216	Maximum of Log Data	5.375
Mean	27.98	Mean of log Data	2.929
Median	16.4	SD of log Data	0.844
SD	35.35		
Coefficient of Variation	1.263		
Skewness	3.794		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.26	Lilliefors Test Statistic	0.0827
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973

Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		34.43		95% H-UCL		32.45	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		38.82	
95% Adjusted-CLT UCL		36.09		97.5% Chebyshev (MVUE) UCL		44.12	
95% Modified-t UCL		34.7		99% Chebyshev (MVUE) UCL		54.55	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		1.342		Data appear Lognormal at 5% Significance Level			
Theta Star		20.85					
nu star		222.7					
Approximate Chi Square Value (.05)		189.2		Nonparametric Statistics			
Adjusted Level of Significance		0.0471		95% CLT UCL		34.36	
Adjusted Chi Square Value		188.6		95% Jackknife UCL		34.43	
				95% Standard Bootstrap UCL		34.22	
Anderson-Darling Test Statistic		3.103		95% Bootstrap-t UCL		37.53	
Anderson-Darling 5% Critical Value		0.773		95% Hall's Bootstrap UCL		39.93	
Kolmogorov-Smirnov Test Statistic		0.147		95% Percentile Bootstrap UCL		34.91	
Kolmogorov-Smirnov 5% Critical Value		0.1		95% BCA Bootstrap UCL		36.81	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		44.89	
				97.5% Chebyshev(Mean, Sd) UCL		52.21	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		66.58	
95% Approximate Gamma UCL		32.94					
95% Adjusted Gamma UCL		33.04					
Potential UCL to Use				Use 95% H-UCL		32.45	

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	78
Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.466
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.155	Mean of log Data	-3.578
Median	0.0061	SD of log Data	1.966
SD	0.303		
Coefficient of Variation	1.952		
Skewness	3.008		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.31	Lilliefors Test Statistic	0.299
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.21	95% H-UCL	0.396
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.443

95% Adjusted-CLT UCL	0.222	97.5% Chebyshev (MVUE) UCL	0.556
95% Modified-t UCL	0.212	99% Chebyshev (MVUE) UCL	0.779
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.408		
nu star	63.11		
Approximate Chi Square Value (.05)	45.83	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.21
Adjusted Chi Square Value	45.57	95% Jackknife UCL	0.21
		95% Standard Bootstrap UCL	0.21
Anderson-Darling Test Statistic	6.569	95% Bootstrap-t UCL	0.229
Anderson-Darling 5% Critical Value	0.846	95% Hall's Bootstrap UCL	0.225
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	0.214
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.222
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.3
		97.5% Chebyshev(Mean, Sd) UCL	0.363
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.486
95% Approximate Gamma UCL	0.214		
95% Adjusted Gamma UCL	0.215		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.363

Result or 1/2 SDL (dibenzofuran)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	48
Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.083
Maximum	0.821	Maximum of Log Data	-0.197
Mean	0.0378	Mean of log Data	-4.288
Median	0.0071	SD of log Data	1.133
SD	0.107		
Coefficient of Variation	2.831		
Skewness	6.111		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.384	Lilliefors Test Statistic	0.376
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0574	95% H-UCL	0.0351
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0431
95% Adjusted-CLT UCL	0.0656	97.5% Chebyshev (MVUE) UCL	0.0506
95% Modified-t UCL	0.0587	99% Chebyshev (MVUE) UCL	0.0653
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.594	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0636		
nu star	98.68		
Approximate Chi Square Value (.05)	76.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0572
Adjusted Chi Square Value	76.42	95% Jackknife UCL	0.0574
		95% Standard Bootstrap UCL	0.0568
Anderson-Darling Test Statistic	13.02	95% Bootstrap-t UCL	0.104
Anderson-Darling 5% Critical Value	0.808	95% Hall's Bootstrap UCL	0.15
Kolmogorov-Smirnov Test Statistic	0.378	95% Percentile Bootstrap UCL	0.0589
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0688
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0891
		97.5% Chebyshev(Mean, Sd) UCL	0.111
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.155
95% Approximate Gamma UCL	0.0486		
95% Adjusted Gamma UCL	0.0488		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.111

Result or 1/2 SDL (dieltrin)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	57
Raw Statistics		Log-transformed Statistics	
Minimum	7.0000E-5	Minimum of Log Data	-9.567
Maximum	0.0205	Maximum of Log Data	-3.887
Mean	9.9705E-4	Mean of log Data	-8.475
Median	8.3000E-5	SD of log Data	1.456
SD	0.0030		
Coefficient of Variation	3.053		
Skewness	5.171		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.38	Lilliefors Test Statistic	0.314
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0015	95% H-UCL	9.2982E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0011
95% Adjusted-CLT UCL	0.0017	97.5% Chebyshev (MVUE) UCL	0.0013
95% Modified-t UCL	0.0015	99% Chebyshev (MVUE) UCL	0.0018
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.411	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0024		
nu star	68.17		
Approximate Chi Square Value (.05)	50.17	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0015
Adjusted Chi Square Value	49.9	95% Jackknife UCL	0.0015

[illegible]

Result or 1/2 SDL (di-n-butyl phthalate)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	55
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Raw Statistics

Minimum	0.0126
Maximum	0.753
Mean	0.048
Median	0.0143
SD	0.102
of Variation	2.121
Skewness	4.995

Log-transformed Statistics

Minimum of Log Data	-4.378
Maximum of Log Data	-0.284
Mean of log Data	-3.781
SD of log Data	0.966

Relevant UCL Statistics

Normal Distribution Test

Lilliefors Test Statistic	0.375
Lilliefors Critical Value	0.0973

Lognormal Distribution Test

Lilliefors Test Statistic	0.401
Lilliefors Critical Value	0.0973

Data not Normal at 5% Significance Level

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 0.0666

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL 0.0729

95% Modified-t UCL 0.0676

Assuming Lognormal Distribution

95% H-UCL	0.0459
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95% Chebyshev (MVUE) UCL	0.0558
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97.5% Chebyshev (MVUE) UCL	0.0643
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99% Chebyshev (MVUE) UCL	0.081
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Gamma Distribution Test

k star (bias corrected) 0.777

Theta Star 0.0618

nu star 129

Approximate Chi Square Value (.05) 103.7

Adjusted Level of Significance 0.0471Adjusted Chi Square Value 103.4

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Nonparametric Statistics

95% CLT UCL 0.0664

95% Jackknife UCL 0.0666

95% Standard Bootstrap UCL 0.0664

95% Bootstrap-t UCL 0.0837

95% Hall's Bootstrap UCL 0.129

95% Percentile Bootstrap UCL	0.0691
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95% BCA Bootstrap UCL	0.074
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Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0967
				97.5% Chebyshev(Mean, Sd) UCL		0.118
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.159
95% Approximate Gamma UCL		0.0597				
95% Adjusted Gamma UCL		0.0599				
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.0967
Result or 1/2 SDL (endosulfan sulfate)						
General Statistics						
Number of Valid Samples		83	Number of Unique Samples		63	
Raw Statistics			Log-transformed Statistics			
Minimum		1.3250E-4	Minimum of Log Data		-8.929	
Maximum		0.0713	Maximum of Log Data		-2.641	
Mean		0.002	Mean of log Data		-8.01	
Median		1.5450E-4	SD of log Data		1.391	
SD		0.0084				
Coefficient of Variation		4.216				
Skewness		7.243				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Lilliefors Test Statistic		0.424	Lilliefors Test Statistic		0.34	
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.0035	95% H-UCL		0.0013	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0016	
95% Adjusted-CLT UCL		0.0043	97.5% Chebyshev (MVUE) UCL		0.0019	
95% Modified-t UCL		0.0036	99% Chebyshev (MVUE) UCL		0.0025	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.365	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0054				
nu star		60.65				
Approximate Chi Square Value (.05)		43.74	Nonparametric Statistics			
Adjusted Level of Significance		0.0471	95% CLT UCL		0.0035	
Adjusted Chi Square Value		43.48	95% Jackknife UCL		0.0035	
			95% Standard Bootstrap UCL		0.0035	
Anderson-Darling Test Statistic		15.84	95% Bootstrap-t UCL		0.0080	
Anderson-Darling 5% Critical Value		0.849	95% Hall's Bootstrap UCL		0.0090	
Kolmogorov-Smirnov Test Statistic		0.343	95% Percentile Bootstrap UCL		0.0036	
Kolmogorov-Smirnov 5% Critical Value		0.106	95% BCA Bootstrap UCL		0.0047	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0060	
			97.5% Chebyshev(Mean, Sd) UCL		0.0077	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0112	
95% Approximate Gamma UCL		0.0027				
95% Adjusted Gamma UCL		0.0027				

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	67
Raw Statistics		Log-transformed Statistics	
Minimum	2.1300E-4	Minimum of Log Data	-8.454
Maximum	0.02	Maximum of Log Data	-3.912
Mean	0.0016	Mean of log Data	-7.554
Median	2.4500E-4	SD of log Data	1.31
SD	0.0034		
Coefficient of Variation	2.05		
Skewness	3.169		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.359	Lilliefors Test Statistic	0.362
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0023	95% H-UCL	0.0017
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0022
95% Adjusted-CLT UCL	0.0024	97.5% Chebyshev (MVUE) UCL	0.0026
95% Modified-t UCL	0.0023	99% Chebyshev (MVUE) UCL	0.0034
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.528	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0031		
nu star	87.68		
Approximate Chi Square Value (.05)	67.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0023
Adjusted Chi Square Value	66.77	95% Jackknife UCL	0.0023
		95% Standard Bootstrap UCL	0.0023
Anderson-Darling Test Statistic	13.72	95% Bootstrap-t UCL	0.0025
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.0024
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	0.0023
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0025
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0033
		97.5% Chebyshev(Mean, Sd) UCL	0.0040
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0054
95% Approximate Gamma UCL	0.0021		
95% Adjusted Gamma UCL	0.0022		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0040

Result or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	78
Raw Statistics		Log-transformed Statistics	

Minimum	0.0053	Minimum of Log Data	-5.231
Maximum	14.2	Maximum of Log Data	2.653
Mean	0.799	Mean of log Data	-2.284
Median	0.0748	SD of log Data	2.188
SD	1.943		
Coefficient of Variation	2.431		
Skewness	4.772		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.341	Lilliefors Test Statistic	0.089
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.154	95% H-UCL	2.656
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.735
95% Adjusted-CLT UCL	1.269	97.5% Chebyshev (MVUE) UCL	3.477
95% Modified-t UCL	1.173	99% Chebyshev (MVUE) UCL	4.936
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.326	Data appear Lognormal at 5% Significance Level	
Theta Star	2.453		
nu star	54.08		
Approximate Chi Square Value (.05)	38.19	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	1.15
Adjusted Chi Square Value	37.95	95% Jackknife UCL	1.154
		95% Standard Bootstrap UCL	1.149
Anderson-Darling Test Statistic	3.83	95% Bootstrap-t UCL	1.4
Anderson-Darling 5% Critical Value	0.859	95% Hall's Bootstrap UCL	2.632
Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	1.187
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	1.304
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.729
		97.5% Chebyshev(Mean, Sd) UCL	2.131
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.921
95% Approximate Gamma UCL	1.132		
95% Adjusted Gamma UCL	1.139		
Potential UCL to Use		Use 95% H-UCL	2.656

Result or 1/2 SDL (fluorene)

General Statistics

Number of Valid Samples		83	Number of Unique Samples		76
Raw Statistics			Log-transformed Statistics		
Minimum	0.0043		Minimum of Log Data	-5.449	
Maximum	1.11		Maximum of Log Data	0.104	
Mean	0.0515		Mean of log Data	-4.291	
Median	0.0050		SD of log Data	1.395	
SD	0.152				

Coefficient of Variation			2.942						
Skewness			5.801						
Relevant UCL Statistics									
Normal Distribution Test				Lognormal Distribution Test					
Lilliefors Test Statistic			0.378	Lilliefors Test Statistic				0.312	
Lilliefors Critical Value			0.0973	Lilliefors Critical Value				0.0973	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level					
Assuming Normal Distribution				Assuming Lognormal Distribution					
95% Student's-t UCL			0.0792	95% H-UCL				0.0544	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL				0.067	
95% Adjusted-CLT UCL			0.0902	97.5% Chebyshev (MVUE) UCL				0.0807	
95% Modified-t UCL			0.0809	99% Chebyshev (MVUE) UCL				0.108	
Gamma Distribution Test				Data Distribution					
k star (bias corrected)			0.473	Data do not follow a Discernable Distribution (0.05)					
Theta Star			0.109						
nu star			78.47						
Approximate Chi Square Value (.05)			59.06	Nonparametric Statistics					
Adjusted Level of Significance			0.0471	95% CLT UCL				0.0789	
Adjusted Chi Square Value			58.76	95% Jackknife UCL				0.0792	
				95% Standard Bootstrap UCL				0.0786	
Anderson-Darling Test Statistic			9.551	95% Bootstrap-t UCL				0.138	
Anderson-Darling 5% Critical Value			0.823	95% Hall's Bootstrap UCL				0.208	
Kolmogorov-Smirnov Test Statistic			0.297	95% Percentile Bootstrap UCL				0.0817	
Kolmogorov-Smirnov 5% Critical Value			0.104	95% BCA Bootstrap UCL				0.0957	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL				0.124	
				97.5% Chebyshev(Mean, Sd) UCL				0.155	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL				0.217	
95% Approximate Gamma UCL			0.0684						
95% Adjusted Gamma UCL			0.0688						
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL				0.155	

Result or 1/2 SDL (gamma-chlordane)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		57
Raw Statistics			Log-transformed Statistics		
Minimum		1.1000E-4	Minimum of Log Data		-9.115
Maximum		0.0156	Maximum of Log Data		-4.16
Mean		8.2679E-4	Mean of log Data		-8.449
Median		1.2500E-4	SD of log Data		1.205
SD		0.0024			
Coefficient of Variation		2.992			
Skewness		4.837			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		

Lilliefors Test Statistic		0.411	Lilliefors Test Statistic		0.4
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0012	95% H-UCL		6.1126E-4
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		7.5378E-4
95% Adjusted-CLT UCL		0.0014	97.5% Chebyshev (MVUE) UCL		8.9135E-4
95% Modified-t UCL		0.0013	99% Chebyshev (MVUE) UCL		0.0011
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.465	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0017			
nu star		77.18			
Approximate Chi Square Value (.05)		57.94	Nonparametric Statistics		
Adjusted Level of Significance		0.0471	95% CLT UCL		0.0012
Adjusted Chi Square Value		57.65	95% Jackknife UCL		0.0012
			95% Standard Bootstrap UCL		0.0012
Anderson-Darling Test Statistic		19.32	95% Bootstrap-t UCL		0.0017
Anderson-Darling 5% Critical Value		0.825	95% Hall's Bootstrap UCL		0.0019
Kolmogorov-Smirnov Test Statistic		0.428	95% Percentile Bootstrap UCL		0.0013
Kolmogorov-Smirnov 5% Critical Value		0.104	95% BCA Bootstrap UCL		0.0015
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0020
			97.5% Chebyshev(Mean, Sd) UCL		0.0025
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0035
95% Approximate Gamma UCL		0.0011			
95% Adjusted Gamma UCL		0.0011			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.0025
Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)					
General Statistics					
Number of Valid Samples		83	Number of Unique Samples		78
Raw Statistics			Log-transformed Statistics		
Minimum		0.0071	Minimum of Log Data		-4.948
Maximum		6.49	Maximum of Log Data		1.87
Mean		0.47	Mean of log Data		-2.172
Median		0.11	SD of log Data		1.821
SD		0.94			
Coefficient of Variation		2			
Skewness		3.998			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.319	Lilliefors Test Statistic		0.156
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		

95% Student's-t UCL	0.642	95% H-UCL	1.122
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.305
95% Adjusted-CLT UCL	0.688	97.5% Chebyshev (MVUE) UCL	1.624
95% Modified-t UCL	0.649	99% Chebyshev (MVUE) UCL	2.251
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.446	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.053		
nu star	74.09		
Approximate Chi Square Value (.05)	55.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.64
Adjusted Chi Square Value	54.98	95% Jackknife UCL	0.642
		95% Standard Bootstrap UCL	0.638
Anderson-Darling Test Statistic	3.485	95% Bootstrap-t UCL	0.722
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	0.812
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	0.656
Kolmogorov-Smirnov 5% Critical Value	0.104	95% BCA Bootstrap UCL	0.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.92
		97.5% Chebyshev(Mean, Sd) UCL	1.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.497
95% Approximate Gamma UCL	0.63		
95% Adjusted Gamma UCL	0.634		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.115

Result or 1/2 SDL (iron)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	73
Raw Statistics		Log-transformed Statistics	
Minimum	3450	Minimum of Log Data	8.146
Maximum	77100	Maximum of Log Data	11.25
Mean	16285	Mean of log Data	9.548
Median	13400	SD of log Data	0.52
SD	11193		
Coefficient of Variation	0.687		
Skewness	3.11		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.205	Lilliefors Test Statistic	0.0958
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18329	95% H-UCL	17845
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20231
95% Adjusted-CLT UCL	18754	97.5% Chebyshev (MVUE) UCL	22055
95% Modified-t UCL	18399	99% Chebyshev (MVUE) UCL	25638

Gamma Distribution Test				Data Distribution			
k star (bias corrected)	3.376	Data appear Lognormal at 5% Significance Level					
Theta Star	4824						
nu star	560.3						
Approximate Chi Square Value (.05)	506.4	Nonparametric Statistics					
Adjusted Level of Significance	0.0471	95% CLT UCL				18306	
Adjusted Chi Square Value	505.5	95% Jackknife UCL				18329	
		95% Standard Bootstrap UCL				18299	
Anderson-Darling Test Statistic	2.12	95% Bootstrap-t UCL				18935	
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL				19503	
Kolmogorov-Smirnov Test Statistic	0.137	95% Percentile Bootstrap UCL				18453	
Kolmogorov-Smirnov 5% Critical Value	0.0987	95% BCA Bootstrap UCL				18869	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL				21640	
		97.5% Chebyshev(Mean, Sd) UCL				23957	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL				28509	
95% Approximate Gamma UCL	18019						
95% Adjusted Gamma UCL	18051						
Potential UCL to Use		Use 95% H-UCL				17845	
Result or 1/2 SDL (lead)							
General Statistics							
Number of Valid Samples	83	Number of Unique Samples				80	
Raw Statistics			Log-transformed Statistics				
Minimum	2.82	Minimum of Log Data			1.037		
Maximum	643	Maximum of Log Data			6.466		
Mean	69.61	Mean of log Data			3.584		
Median	34.4	SD of log Data			1.077		
SD	112.8						
Coefficient of Variation	1.62						
Skewness	3.653						
Relevant UCL Statistics							
Normal Distribution Test			Lognormal Distribution Test				
Lilliefors Test Statistic	0.277	Lilliefors Test Statistic			0.0781		
Lilliefors Critical Value	0.0973	Lilliefors Critical Value			0.0973		
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level				
Assuming Normal Distribution			Assuming Lognormal Distribution				
95% Student's-t UCL	90.2	95% H-UCL			84.5		
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL			103.5	
95% Adjusted-CLT UCL	95.27	97.5% Chebyshev (MVUE) UCL			120.8		
95% Modified-t UCL	91.03	99% Chebyshev (MVUE) UCL			154.8		
Gamma Distribution Test			Data Distribution				
k star (bias corrected)	0.864	Data appear Lognormal at 5% Significance Level					
Theta Star	80.56						
nu star	143.4						
Approximate Chi Square Value (.05)	116.8	Nonparametric Statistics					

Adjusted Level of Significance	0.0471	95% CLT UCL	89.97
Adjusted Chi Square Value	116.3	95% Jackknife UCL	90.2
		95% Standard Bootstrap UCL	89.75
Anderson-Darling Test Statistic	3.258	95% Bootstrap-t UCL	100.5
Anderson-Darling 5% Critical Value	0.787	95% Hall's Bootstrap UCL	94.9
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	91.31
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	95.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	123.6
		97.5% Chebyshev(Mean, Sd) UCL	146.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	192.8
95% Approximate Gamma UCL	85.51		
95% Adjusted Gamma UCL	85.82		
Potential UCL to Use		Use 95% H-UCL	84.5

Result or 1/2 SDL (lithium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	80
Raw Statistics		Log-transformed Statistics	
Minimum	0.65	Minimum of Log Data	-0.431
Maximum	28	Maximum of Log Data	3.332
Mean	7.856	Mean of log Data	1.76
Median	6.44	SD of log Data	0.847
SD	5.715		
Coefficient of Variation	0.728		
Skewness	1.032		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.148	Lilliefors Test Statistic	0.0724
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.899	95% H-UCL	10.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.11
95% Adjusted-CLT UCL	8.963	97.5% Chebyshev (MVUE) UCL	13.77
95% Modified-t UCL	8.911	99% Chebyshev (MVUE) UCL	17.03
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.749	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.492		
nu star	290.3		
Approximate Chi Square Value (.05)	251.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	8.887
Adjusted Chi Square Value	251.2	95% Jackknife UCL	8.899
		95% Standard Bootstrap UCL	8.869
Anderson-Darling Test Statistic	0.362	95% Bootstrap-t UCL	9.045
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	9.048

Kolmogorov-Smirnov Test Statistic	0.0621	95% Percentile Bootstrap UCL	8.862
Kolmogorov-Smirnov 5% Critical Value	0.0996	95% BCA Bootstrap UCL	9.001
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.59
		97.5% Chebyshev(Mean, Sd) UCL	11.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.1
95% Approximate Gamma UCL	9.055		
95% Adjusted Gamma UCL	9.078		
Potential UCL to Use		Use 95% Approximate Gamma UCL	9.055

Result or 1/2 SDL (manganese)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	71
Raw Statistics		Log-transformed Statistics	
Minimum	59.3	Minimum of Log Data	4.083
Maximum	892	Maximum of Log Data	6.793
Mean	257.4	Mean of log Data	5.455
Median	224	SD of log Data	0.426
SD	129.3		
Coefficient of Variation	0.502		
Skewness	2.305		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.196	Lilliefors Test Statistic	0.102
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	281.1	95% H-UCL	278.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	310.2
95% Adjusted-CLT UCL	284.6	97.5% Chebyshev (MVUE) UCL	333.7
95% Modified-t UCL	281.7	99% Chebyshev (MVUE) UCL	379.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.208	Data do not follow a Discernable Distribution (0.05)	
Theta Star	49.43		
nu star	864.6		
Approximate Chi Square Value (.05)	797.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	280.8
Adjusted Chi Square Value	796.2	95% Jackknife UCL	281.1
		95% Standard Bootstrap UCL	280.6
Anderson-Darling Test Statistic	1.874	95% Bootstrap-t UCL	288.2
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	288.5
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	282.3
Kolmogorov-Smirnov 5% Critical Value	0.0983	95% BCA Bootstrap UCL	286.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	319.3
		97.5% Chebyshev(Mean, Sd) UCL	346.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	398.7

95% Approximate Gamma UCL	279.1		
95% Adjusted Gamma UCL	279.5		
Potential UCL to Use		Use 95% Student's-t UCL	281.1
		or 95% Modified-t UCL	281.7

Result or 1/2 SDL (mercury)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	55
Raw Statistics		Log-transformed Statistics	
Minimum	0.001	Minimum of Log Data	-6.908
Maximum	0.66	Maximum of Log Data	-0.416
Mean	0.0227	Mean of log Data	-4.95
Median	0.0065	SD of log Data	1.339
SD	0.0752		
Coefficient of Variation	3.315		
Skewness	7.742		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.387	Lilliefors Test Statistic	0.0883
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0364	95% H-UCL	0.0254
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0314
95% Adjusted-CLT UCL	0.0437	97.5% Chebyshev (MVUE) UCL	0.0376
95% Modified-t UCL	0.0376	99% Chebyshev (MVUE) UCL	0.0498
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.528	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0429		
nu star	87.68		
Approximate Chi Square Value (.05)	67.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0362
Adjusted Chi Square Value	66.78	95% Jackknife UCL	0.0364
		95% Standard Bootstrap UCL	0.0365
Anderson-Darling Test Statistic	5.016	95% Bootstrap-t UCL	0.0699
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.0863
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	0.0377
Kolmogorov-Smirnov 5% Critical Value	0.103	95% BCA Bootstrap UCL	0.0485
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0586
		97.5% Chebyshev(Mean, Sd) UCL	0.0742
		99% Chebyshev(Mean, Sd) UCL	0.105
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.0296		
95% Adjusted Gamma UCL	0.0298		
Potential UCL to Use		Use 95% H-UCL	0.0254

Result or 1/2 SDL (molybdenum)			
General Statistics			
Number of Valid Samples		83	Number of Unique Samples
			67
Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	8.42	Maximum of Log Data	2.131
Mean	1.306	Mean of log Data	-0.575
Median	0.91	SD of log Data	1.522
SD	1.588		
Coefficient of Variation	1.216		
Skewness	2.126		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.23	Lilliefors Test Statistic	0.136
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.596	95% H-UCL	2.859
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.492
95% Adjusted-CLT UCL	1.637	97.5% Chebyshev (MVUE) UCL	4.25
95% Modified-t UCL	1.603	99% Chebyshev (MVUE) UCL	5.739
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.698	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.872		
nu star	115.8		
Approximate Chi Square Value (.05)	91.98	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	1.593
Adjusted Chi Square Value	91.61	95% Jackknife UCL	1.596
		95% Standard Bootstrap UCL	1.589
Anderson-Darling Test Statistic	0.65	95% Bootstrap-t UCL	1.662
Anderson-Darling 5% Critical Value	0.797	95% Hall's Bootstrap UCL	1.639
Kolmogorov-Smirnov Test Statistic	0.0752	95% Percentile Bootstrap UCL	1.596
Kolmogorov-Smirnov 5% Critical Value	0.102	95% BCA Bootstrap UCL	1.645
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.066
		97.5% Chebyshev(Mean, Sd) UCL	2.395
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.041
95% Approximate Gamma UCL	1.645		
95% Adjusted Gamma UCL	1.652		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1.645
Result or 1/2 SDL (nickel)			
General Statistics			

Number of Valid Samples		83	Number of Unique Samples		67
Raw Statistics			Log-transformed Statistics		
	Minimum	2.84		Minimum of Log Data	1.044
	Maximum	36.7		Maximum of Log Data	3.603
	Mean	11.64		Mean of log Data	2.373
	Median	11.2		SD of log Data	0.411
	SD	4.938			
	Coefficient of Variation	0.424			
	Skewness	1.825			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.13		Lilliefors Test Statistic	0.0874
	Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	12.54		95% H-UCL	12.67
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	14.05
	95% Adjusted-CLT UCL	12.65		97.5% Chebyshev (MVUE) UCL	15.08
	95% Modified-t UCL	12.56		99% Chebyshev (MVUE) UCL	17.1
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	6.095	Data appear Gamma Distributed at 5% Significance Level		
	Theta Star	1.91			
	nu star	1012			
	Approximate Chi Square Value (.05)	938.9	Nonparametric Statistics		
	Adjusted Level of Significance	0.0471		95% CLT UCL	12.53
	Adjusted Chi Square Value	937.7		95% Jackknife UCL	12.54
				95% Standard Bootstrap UCL	12.55
	Anderson-Darling Test Statistic	0.505		95% Bootstrap-t UCL	12.68
	Anderson-Darling 5% Critical Value	0.754		95% Hall's Bootstrap UCL	12.78
	Kolmogorov-Smirnov Test Statistic	0.0926		95% Percentile Bootstrap UCL	12.53
	Kolmogorov-Smirnov 5% Critical Value	0.0982		95% BCA Bootstrap UCL	12.6
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	14
Assuming Gamma Distribution				97.5% Chebyshev(Mean, Sd) UCL	15.02
	95% Approximate Gamma UCL	12.54		99% Chebyshev(Mean, Sd) UCL	17.03
	95% Adjusted Gamma UCL	12.56			
Potential UCL to Use				Use 95% Approximate Gamma UCL	12.54

Result or 1/2 SDL (phenanthrene)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		74
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0057		Minimum of Log Data	-5.159
	Maximum	12.6		Maximum of Log Data	2.534

Mean	0.512	Mean of log Data	-2.572
Median	0.063	SD of log Data	2.001
SD	1.543		
Coefficient of Variation	3.013		
Skewness	6.446		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.371	Lilliefors Test Statistic	0.132
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.794	95% H-UCL	1.186
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.312
95% Adjusted-CLT UCL	0.919	97.5% Chebyshev (MVUE) UCL	1.651
95% Modified-t UCL	0.814	99% Chebyshev (MVUE) UCL	2.317
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.348	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.472		
nu star	57.78		
Approximate Chi Square Value (.05)	41.31	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.791
Adjusted Chi Square Value	41.06	95% Jackknife UCL	0.794
		95% Standard Bootstrap UCL	0.795
Anderson-Darling Test Statistic	4.225	95% Bootstrap-t UCL	1.251
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	1.967
Kolmogorov-Smirnov Test Statistic	0.182	95% Percentile Bootstrap UCL	0.802
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.965
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.251
		97.5% Chebyshev(Mean, Sd) UCL	1.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.198
95% Approximate Gamma UCL	0.717		
95% Adjusted Gamma UCL	0.721		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2.198

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples		83	Number of Unique Samples		76
Raw Statistics			Log-transformed Statistics		
Minimum	0.0055		Minimum of Log Data	-5.194	
Maximum	8.47		Maximum of Log Data	2.137	
Mean	0.533		Mean of log Data	-2.413	
Median	0.075		SD of log Data	1.994	
SD	1.209				
Coefficient of Variation	2.27				
Skewness	4.319				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.333	Lilliefors Test Statistic	0.0815
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.754	95% H-UCL	1.366
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.514
95% Adjusted-CLT UCL	0.818	97.5% Chebyshev (MVUE) UCL	1.905
95% Modified-t UCL	0.764	99% Chebyshev (MVUE) UCL	2.672
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.368	Data appear Lognormal at 5% Significance Level	
Theta Star	1.449		
nu star	61.04		
Approximate Chi Square Value (.05)	44.07	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.751
Adjusted Chi Square Value	43.82	95% Jackknife UCL	0.754
		95% Standard Bootstrap UCL	0.753
Anderson-Darling Test Statistic	3.7	95% Bootstrap-t UCL	0.873
Anderson-Darling 5% Critical Value	0.849	95% Hall's Bootstrap UCL	1.429
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	0.764
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.821
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.112
		97.5% Chebyshev(Mean, Sd) UCL	1.362
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.854
95% Approximate Gamma UCL	0.738		
95% Adjusted Gamma UCL	0.742		
Potential UCL to Use		Use 95% H-UCL	1.366

Result or 1/2 SDL (selenium)

General Statistics			
Number of Valid Samples		83	
		Number of Unique Samples	
		19	
Raw Statistics		Log-transformed Statistics	
Minimum	0.21	Minimum of Log Data	-1.561
Maximum	0.48	Maximum of Log Data	-0.734
Mean	0.258	Mean of log Data	-1.377
Median	0.24	SD of log Data	0.202
SD	0.0663		
Coefficient of Variation	0.257		
Skewness	2.645		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.363	Lilliefors Test Statistic	0.322
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL		0.27		95% H-UCL		0.267		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL				0.282
95% Adjusted-CLT UCL		0.272		97.5% Chebyshev (MVUE) UCL		0.293		
95% Modified-t UCL		0.271		99% Chebyshev (MVUE) UCL		0.315		
Gamma Distribution Test				Data Distribution				
k star (bias corrected)		20.56		Data do not follow a Discernable Distribution (0.05)				
Theta Star		0.0126						
nu star		3413						
Approximate Chi Square Value (.05)		3278		Nonparametric Statistics				
Adjusted Level of Significance		0.0471		95% CLT UCL		0.27		
Adjusted Chi Square Value		3276		95% Jackknife UCL		0.27		
				95% Standard Bootstrap UCL		0.27		
Anderson-Darling Test Statistic		13.15		95% Bootstrap-t UCL		0.274		
Anderson-Darling 5% Critical Value		0.75		95% Hall's Bootstrap UCL		0.272		
Kolmogorov-Smirnov Test Statistic		0.338		95% Percentile Bootstrap UCL		0.271		
Kolmogorov-Smirnov 5% Critical Value		0.0978		95% BCA Bootstrap UCL		0.273		
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.29		
				97.5% Chebyshev(Mean, Sd) UCL		0.304		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.331		
95% Approximate Gamma UCL		0.269						
95% Adjusted Gamma UCL		0.269						
Potential UCL to Use				Use 95% Student's-t UCL		0.27		
				or 95% Modified-t UCL		0.271		
Result or 1/2 SDL (silver)								
General Statistics								
Number of Valid Samples		83		Number of Unique Samples		24		
Raw Statistics				Log-transformed Statistics				
Minimum		0.0235		Minimum of Log Data		-3.751		
Maximum		0.99		Maximum of Log Data		-0.0101		
Mean		0.0573		Mean of log Data		-3.388		
Median		0.0265		SD of log Data		0.715		
SD		0.125						
Coefficient of Variation		2.178						
Skewness		5.862						
Relevant UCL Statistics								
Normal Distribution Test				Lognormal Distribution Test				
Lilliefors Test Statistic		0.439		Lilliefors Test Statistic		0.413		
Lilliefors Critical Value		0.0973		Lilliefors Critical Value		0.0973		
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL		0.08		95% H-UCL		0.0511		

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0599
95% Adjusted-CLT UCL	0.0892	97.5% Chebyshev (MVUE) UCL		0.0671
95% Modified-t UCL	0.0815	99% Chebyshev (MVUE) UCL		0.081
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.053	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0544			
nu star	174.9			
Approximate Chi Square Value (.05)	145.3	Nonparametric Statistics		
Adjusted Level of Significance	0.0471	95% CLT UCL		0.0798
Adjusted Chi Square Value	144.8	95% Jackknife UCL		0.08
		95% Standard Bootstrap UCL		0.0798
Anderson-Darling Test Statistic	21.47	95% Bootstrap-t UCL		0.108
Anderson-Darling 5% Critical Value	0.78	95% Hall's Bootstrap UCL		0.151
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL		0.0815
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL		0.0919
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.117
		97.5% Chebyshev(Mean, Sd) UCL		0.143
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.193
95% Approximate Gamma UCL	0.0689			
95% Adjusted Gamma UCL	0.0691			
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL		0.117

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	76
Raw Statistics		Log-transformed Statistics	
Minimum	16.5	Minimum of Log Data	2.803
Maximum	527	Maximum of Log Data	6.267
Mean	70.61	Mean of log Data	4.06
Median	57.3	SD of log Data	0.583
SD	63.98		
Coefficient of Variation	0.906		
Skewness	5.044		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.241	Lilliefors Test Statistic	0.105
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	82.29	95% H-UCL	77.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.08
95% Adjusted-CLT UCL	86.31	97.5% Chebyshev (MVUE) UCL	97.96
95% Modified-t UCL	82.94	99% Chebyshev (MVUE) UCL	115.4
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	2.606	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.1		
nu star	432.5		
Approximate Chi Square Value (.05)	385.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	82.16
Adjusted Chi Square Value	384.5	95% Jackknife UCL	82.29
		95% Standard Bootstrap UCL	81.58
Anderson-Darling Test Statistic	2.313	95% Bootstrap-t UCL	91.45
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	135.7
Kolmogorov-Smirnov Test Statistic	0.156	95% Percentile Bootstrap UCL	82.83
Kolmogorov-Smirnov 5% Critical Value	0.099	95% BCA Bootstrap UCL	86.92
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.2
		97.5% Chebyshev(Mean, Sd) UCL	114.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	140.5
95% Approximate Gamma UCL	79.26		
95% Adjusted Gamma UCL	79.42		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	101.2

Result or 1/2 SDL (tin)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	35
Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.47
Maximum	4.95	Maximum of Log Data	1.599
Mean	0.611	Mean of log Data	-0.898
Median	0.265	SD of log Data	0.768
SD	0.793		
Coefficient of Variation	1.296		
Skewness	3.22		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.325	Lilliefors Test Statistic	0.334
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.756	95% H-UCL	0.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.769
95% Adjusted-CLT UCL	0.787	97.5% Chebyshev (MVUE) UCL	0.866
95% Modified-t UCL	0.761	99% Chebyshev (MVUE) UCL	1.057
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.458		
nu star	221.4		
Approximate Chi Square Value (.05)	188	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.755

Adjusted Chi Square Value	187.4	95% Jackknife UCL	0.756
		95% Standard Bootstrap UCL	0.756
Anderson-Darling Test Statistic	11.5	95% Bootstrap-t UCL	0.816
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	0.816
Kolmogorov-Smirnov Test Statistic	0.339	95% Percentile Bootstrap UCL	0.768
Kolmogorov-Smirnov 5% Critical Value	0.1	95% BCA Bootstrap UCL	0.802
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.991
		97.5% Chebyshev(Mean, Sd) UCL	1.155
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.477
95% Approximate Gamma UCL	0.72		
95% Adjusted Gamma UCL	0.722		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.991

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	71
Raw Statistics		Log-transformed Statistics	
Minimum	11.5	Minimum of Log Data	2.442
Maximum	645	Maximum of Log Data	6.469
Mean	29.8	Mean of log Data	3.055
Median	19.5	SD of log Data	0.544
SD	69.4		
Coefficient of Variation	2.329		
Skewness	8.71		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.396	Lilliefors Test Statistic	0.193
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	42.47	95% H-UCL	27.51
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.33
95% Adjusted-CLT UCL	50.11	97.5% Chebyshev (MVUE) UCL	34.27
95% Modified-t UCL	43.68	99% Chebyshev (MVUE) UCL	40.05

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.568	Data do not follow a Discernable Distribution (0.05)	
Theta Star	19.01		
nu star	260.3		

Approximate Chi Square Value (.05)		Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	42.33
Adjusted Chi Square Value	223.3	95% Jackknife UCL	42.47
		95% Standard Bootstrap UCL	42.22
Anderson-Darling Test Statistic	11.79	95% Bootstrap-t UCL	96.34
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	87.12
Kolmogorov-Smirnov Test Statistic	0.289	95% Percentile Bootstrap UCL	44.62

Kolmogorov-Smirnov 5% Critical Value		0.0998	95% BCA Bootstrap UCL		53.78
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		63
			97.5% Chebyshev(Mean, Sd) UCL		77.37
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		105.6
95% Approximate Gamma UCL		34.64			
95% Adjusted Gamma UCL		34.73			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		63
Result or 1/2 SDL (vanadium)					
General Statistics					
Number of Valid Samples		83	Number of Unique Samples		67
Raw Statistics			Log-transformed Statistics		
Minimum		5.42	Minimum of Log Data		1.69
Maximum		45.6	Maximum of Log Data		3.82
Mean		13.76	Mean of log Data		2.538
Median		12.9	SD of log Data		0.404
SD		6.248			
Coefficient of Variation		0.454			
Skewness		2.186			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.113	Lilliefors Test Statistic		0.0671
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		14.9	95% H-UCL		14.87
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		16.46
95% Adjusted-CLT UCL		15.06	97.5% Chebyshev (MVUE) UCL		17.65
95% Modified-t UCL		14.93	99% Chebyshev (MVUE) UCL		19.98
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		5.932	Data appear Gamma Distributed at 5% Significance Level		
Theta Star		2.319			
nu star		984.6			
Approximate Chi Square Value (.05)		912.8	Nonparametric Statistics		
Adjusted Level of Significance		0.0471	95% CLT UCL		14.89
Adjusted Chi Square Value		911.6	95% Jackknife UCL		14.9
			95% Standard Bootstrap UCL		14.89
Anderson-Darling Test Statistic		0.532	95% Bootstrap-t UCL		15.15
Anderson-Darling 5% Critical Value		0.754	95% Hall's Bootstrap UCL		15.36
Kolmogorov-Smirnov Test Statistic		0.0752	95% Percentile Bootstrap UCL		14.94
Kolmogorov-Smirnov 5% Critical Value		0.0982	95% BCA Bootstrap UCL		15.03
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		16.75
			97.5% Chebyshev(Mean, Sd) UCL		18.04
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		20.58
95% Approximate Gamma UCL		14.84			

95% Adjusted Gamma UCL		14.86		
Potential UCL to Use			Use 95% Approximate Gamma UCL	14.84
Result or 1/2 SDL (zinc)				
General Statistics				
Number of Valid Samples		83	Number of Unique Samples 81	
Raw Statistics			Log-transformed Statistics	
	Minimum	12.3	Minimum of Log Data	2.51
	Maximum	4770	Maximum of Log Data	8.47
	Mean	601.2	Mean of log Data	5.837
	Median	455	SD of log Data	1.203
	SD	672.8		
	Coefficient of Variation	1.119		
	Skewness	3.386		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
	Lilliefors Test Statistic	0.191	Lilliefors Test Statistic	0.146
	Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
	95% Student's-t UCL	724.1	95% H-UCL	976.4
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	1204
	95% Adjusted-CLT UCL	752	97.5% Chebyshev (MVUE) UCL	1423
	95% Modified-t UCL	728.6	99% Chebyshev (MVUE) UCL	1855
Gamma Distribution Test			Data Distribution	
	k star (bias corrected)	0.996	Data appear Gamma Distributed at 5% Significance Level	
	Theta Star	603.9		
	nu star	165.3		
	Approximate Chi Square Value (.05)	136.5	Nonparametric Statistics	
	Adjusted Level of Significance	0.0471	95% CLT UCL	722.7
	Adjusted Chi Square Value	136.1	95% Jackknife UCL	724.1
			95% Standard Bootstrap UCL	717.7
	Anderson-Darling Test Statistic	0.442	95% Bootstrap-t UCL	763
	Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	816.5
	Kolmogorov-Smirnov Test Statistic	0.0769	95% Percentile Bootstrap UCL	727.9
	Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	758.6
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	923.1
			97.5% Chebyshev(Mean, Sd) UCL	1062
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	1336
	95% Approximate Gamma UCL	727.7		
	95% Adjusted Gamma UCL	730.2		
Potential UCL to Use			Use 95% Approximate Gamma UCL	727.7

APPENDIX A-2

SOUTH OF MARLIN SOIL

General UCL Statistics for Full Data Sets	
User Selected Options	
From File	J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\95% detect frequency soil S of m
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result or 1/2 SDL (1,3,5-trimethylbenzene)

General Statistics			
Number of Valid Samples		83	
Number of Unique Samples		58	
Raw Statistics		Log-transformed Statistics	
Minimum	3.7000E-5	Minimum of Log Data	-10.2
Maximum	4.36	Maximum of Log Data	1.472
Mean	0.099	Mean of log Data	-8.82
Median	7.4500E-5	SD of log Data	1.986
SD	0.632		
Coefficient of Variation	6.391		
Skewness	6.366		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.535	Lilliefors Test Statistic	0.397
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.214	95% H-UCL	0.0022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0024
95% Adjusted-CLT UCL	0.265	97.5% Chebyshev (MVUE) UCL	0.0030
95% Modified-t UCL	0.223	99% Chebyshev (MVUE) UCL	0.0043
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.125	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.79		
nu star	20.8		
Approximate Chi Square Value (.05)	11.44	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.213
Adjusted Chi Square Value	11.32	95% Jackknife UCL	0.214
		95% Standard Bootstrap UCL	0.212
Anderson-Darling Test Statistic	28.64	95% Bootstrap-t UCL	67.91
Anderson-Darling 5% Critical Value	0.984	95% Hall's Bootstrap UCL	42.63
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	0.211
Kolmogorov-Smirnov 5% Critical Value	0.112	95% BCA Bootstrap UCL	0.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.402
		97.5% Chebyshev(Mean, Sd) UCL	0.532
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.79
95% Approximate Gamma UCL	0.18		
95% Adjusted Gamma UCL	0.182		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL		0.532	
Result or 1/2 SDL (2-butanone)					
General Statistics					
Number of Valid Samples		83	Number of Unique Samples		81
Raw Statistics			Log-transformed Statistics		
Minimum		7.1500E-5	Minimum of Log Data		-9.546
Maximum		0.06	Maximum of Log Data		-2.813
Mean		0.0041	Mean of log Data		-6.321
Median		0.0019	SD of log Data		1.38
SD		0.0074			
Coefficient of Variation		1.818			
Skewness		5.537			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.294	Lilliefors Test Statistic		0.133
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0054	95% H-UCL		0.0069
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0085
95% Adjusted-CLT UCL		0.006	97.5% Chebyshev (MVUE) UCL		0.0103
95% Modified-t UCL		0.0055	99% Chebyshev (MVUE) UCL		0.0137
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.708	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0058			
nu star		117.5			
Approximate Chi Square Value (.05)		93.51	Nonparametric Statistics		
Adjusted Level of Significance		0.0471	95% CLT UCL		0.0054
Adjusted Chi Square Value		93.13	95% Jackknife UCL		0.0054
			95% Standard Bootstrap UCL		0.0054
Anderson-Darling Test Statistic		1.855	95% Bootstrap-t UCL		0.0068
Anderson-Darling 5% Critical Value		0.796	95% Hall's Bootstrap UCL		0.0111
Kolmogorov-Smirnov Test Statistic		0.134	95% Percentile Bootstrap UCL		0.0055
Kolmogorov-Smirnov 5% Critical Value		0.102	95% BCA Bootstrap UCL		0.0064
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0077
			97.5% Chebyshev(Mean, Sd) UCL		0.0092
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0123
95% Approximate Gamma UCL		0.0051			
95% Adjusted Gamma UCL		0.0052			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.0092

Result or 1/2 SDL (2-hexanone)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		79
Raw Statistics		Log-transformed Statistics			
	Minimum	1.8900E-4		Minimum of Log Data	-8.574
	Maximum	0.159		Maximum of Log Data	-1.842
	Mean	0.0040		Mean of log Data	-7.35
	Median	3.7750E-4		SD of log Data	1.34
	SD	0.018			
	Coefficient of Variation	4.426			
	Skewness	7.989			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.415		Lilliefors Test Statistic	0.399
	Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.0073		95% H-UCL	0.0023
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0028
	95% Adjusted-CLT UCL	0.0091		97.5% Chebyshev (MVUE) UCL	0.0034
	95% Modified-t UCL	0.0076		99% Chebyshev (MVUE) UCL	0.0045
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.0113			
	nu star	59.38			
Approximate Chi Square Value (.05)		42.66	Nonparametric Statistics		
	Adjusted Level of Significance	0.0471		95% CLT UCL	0.0073
	Adjusted Chi Square Value	42.41		95% Jackknife UCL	0.0073
				95% Standard Bootstrap UCL	0.0072
	Anderson-Darling Test Statistic	20.58		95% Bootstrap-t UCL	0.0146
	Anderson-Darling 5% Critical Value	0.851		95% Hall's Bootstrap UCL	0.0179
	Kolmogorov-Smirnov Test Statistic	0.455		95% Percentile Bootstrap UCL	0.0078
	Kolmogorov-Smirnov 5% Critical Value	0.106		95% BCA Bootstrap UCL	0.0102
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0127
				97.5% Chebyshev(Mean, Sd) UCL	0.0164
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.0237
	95% Approximate Gamma UCL	0.0056			
	95% Adjusted Gamma UCL	0.0056			
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL	0.0164

Result or 1/2 SDL (2-methylnaphthalene)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		84
Raw Statistics			Log-transformed Statistics		
Minimum		0.0047	Minimum of Log Data		-5.354

Maximum	7.21	Maximum of Log Data	1.975
Mean	0.0694	Mean of log Data	-4.533
Median	0.0056	SD of log Data	1.209
SD	0.561		
Coefficient of Variation	8.087		
Skewness	12.66		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.454	Lilliefors Test Statistic	0.354
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.141	95% H-UCL	0.0278
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0338
95% Adjusted-CLT UCL	0.187	97.5% Chebyshev (MVUE) UCL	0.0389
95% Modified-t UCL	0.149	99% Chebyshev (MVUE) UCL	0.0488
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.357	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.194		
nu star	118.4		
Approximate Chi Square Value (.05)	94.29	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.141
Adjusted Chi Square Value	94.11	95% Jackknife UCL	0.141
		95% Standard Bootstrap UCL	0.146
Anderson-Darling Test Statistic	6.024E+28	95% Bootstrap-t UCL	0.686
Anderson-Darling 5% Critical Value	0.854	95% Hall's Bootstrap UCL	0.403
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	0.155
Kolmogorov-Smirnov 5% Critical Value	0.078	95% BCA Bootstrap UCL	0.205
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.259
		97.5% Chebyshev(Mean, Sd) UCL	0.341
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.503
95% Approximate Gamma UCL	0.0871		
95% Adjusted Gamma UCL	0.0873		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.341

Result or 1/2 SDL (4,4'-ddd)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	100
Raw Statistics		Log-transformed Statistics	
Minimum	1.1750E-4	Minimum of Log Data	-9.049
Maximum	1.12	Maximum of Log Data	0.113
Mean	0.0076	Mean of log Data	-8.292
Median	1.3950E-4	SD of log Data	1.373
SD	0.0869		
Coefficient of Variation	11.34		

Skewness		12.86		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Lilliefors Test Statistic	0.473		Lilliefors Test Statistic	0.396
Lilliefors Critical Value	0.0688		Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL	0.0188		95% H-UCL	8.4016E-4
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.0010
95% Adjusted-CLT UCL	0.026		97.5% Chebyshev (MVUE) UCL	0.0012
95% Modified-t UCL	0.0199		99% Chebyshev (MVUE) UCL	0.0015
Gamma Distribution Test			Data Distribution	
k star (bias corrected)	0.213		Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0359			
nu star	70.78			
Approximate Chi Square Value (.05)	52.41		Nonparametric Statistics	
Adjusted Level of Significance	0.0486		95% CLT UCL	0.0188
Adjusted Chi Square Value	52.28		95% Jackknife UCL	0.0188
			95% Standard Bootstrap UCL	0.0185
Anderson-Darling Test Statistic	48.45		95% Bootstrap-t UCL	0.31
Anderson-Darling 5% Critical Value	0.908		95% Hall's Bootstrap UCL	0.188
Kolmogorov-Smirnov Test Statistic	0.432		95% Percentile Bootstrap UCL	0.0211
Kolmogorov-Smirnov 5% Critical Value	0.08		95% BCA Bootstrap UCL	0.0345
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0371
			97.5% Chebyshev(Mean, Sd) UCL	0.0498
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0748
95% Approximate Gamma UCL	0.0104			
95% Adjusted Gamma UCL	0.0104			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL	0.0498

Result or 1/2 SDL (4,4'-dde)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		113
Raw Statistics			Log-transformed Statistics		
Minimum	1.6300E-4		Minimum of Log Data	-8.722	
Maximum	0.0693		Maximum of Log Data	-2.669	
Mean	0.0017		Mean of log Data	-7.973	
Median	1.9425E-4		SD of log Data	1.22	
SD	0.0076				
Coefficient of Variation	4.484				
Skewness	7.741				

Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Lilliefors Test Statistic	0.42	Lilliefors Test Statistic	0.379	

Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0026	95% H-UCL		9.0739E-4
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0011
95% Adjusted-CLT UCL		0.0030	97.5% Chebyshev (MVUE) UCL		0.0012
95% Modified-t UCL		0.0027	99% Chebyshev (MVUE) UCL		0.0016
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.407	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0041			
nu star		135.2			
Approximate Chi Square Value (.05)		109.3	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		0.0026
Adjusted Chi Square Value		109.1	95% Jackknife UCL		0.0026
			95% Standard Bootstrap UCL		0.0026
Anderson-Darling Test Statistic		36.49	95% Bootstrap-t UCL		0.0043
Anderson-Darling 5% Critical Value		0.842	95% Hall's Bootstrap UCL		0.0063
Kolmogorov-Smirnov Test Statistic		0.408	95% Percentile Bootstrap UCL		0.0027
Kolmogorov-Smirnov 5% Critical Value		0.0775	95% BCA Bootstrap UCL		0.0032
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0042
			97.5% Chebyshev(Mean, Sd) UCL		0.0054
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0075
95% Approximate Gamma UCL		0.0021			
95% Adjusted Gamma UCL		0.0021			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.0054

Result or 1/2 SDL (4,4'-ddt)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		114
Raw Statistics			Log-transformed Statistics		
Minimum		6.2500E-5	Minimum of Log Data		-9.68
Maximum		0.113	Maximum of Log Data		-2.18
Mean		0.0037	Mean of log Data		-7.782
Median		1.1075E-4	SD of log Data		2.033
SD		0.0114			
Coefficient of Variation		3.045			
Skewness		6.653			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.373	Lilliefors Test Statistic		0.27
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0051	95% H-UCL		0.0054

95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0067
95% Adjusted-CLT UCL		0.0056	97.5% Chebyshev (MVUE) UCL		0.0083	
95% Modified-t UCL		0.0052	99% Chebyshev (MVUE) UCL		0.0114	
Gamma Distribution Test				Data Distribution		
k star (bias corrected)		0.311	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.012				
nu star		103.2				
Approximate Chi Square Value (.05)		80.8	Nonparametric Statistics			
Adjusted Level of Significance		0.0486	95% CLT UCL		0.0051	
Adjusted Chi Square Value		80.63	95% Jackknife UCL		0.0051	
			95% Standard Bootstrap UCL		0.0051	
Anderson-Darling Test Statistic		16.11	95% Bootstrap-t UCL		0.0064	
Anderson-Darling 5% Critical Value		0.866	95% Hall's Bootstrap UCL		0.0114	
Kolmogorov-Smirnov Test Statistic		0.256	95% Percentile Bootstrap UCL		0.0052	
Kolmogorov-Smirnov 5% Critical Value		0.0785	95% BCA Bootstrap UCL		0.0058	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0075	
			97.5% Chebyshev(Mean, Sd) UCL		0.0092	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0125	
95% Approximate Gamma UCL		0.0047				
95% Adjusted Gamma UCL		0.0047				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.0125	
Result or 1/2 SDL (acenaphthene)						
General Statistics						
Number of Valid Samples		166	Number of Unique Samples		108	
Raw Statistics			Log-transformed Statistics			
Minimum		0.0043	Minimum of Log Data		-5.438	
Maximum		1.69	Maximum of Log Data		0.525	
Mean		0.0419	Mean of log Data		-4.516	
Median		0.0052	SD of log Data		1.296	
SD		0.15				
Coefficient of Variation		3.573				
Skewness		8.834				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Lilliefors Test Statistic		0.401	Lilliefors Test Statistic		0.359	
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.0611	95% H-UCL		0.0324	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0397	
95% Adjusted-CLT UCL		0.0696	97.5% Chebyshev (MVUE) UCL		0.046	
95% Modified-t UCL		0.0625	99% Chebyshev (MVUE) UCL		0.0584	
Gamma Distribution Test			Data Distribution			

k star (bias corrected)	0.472	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0889		
nu star	156.6		
Approximate Chi Square Value (.05)	128.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.061
Adjusted Chi Square Value	128.4	95% Jackknife UCL	0.0611
		95% Standard Bootstrap UCL	0.0611
Anderson-Darling Test Statistic	27.1	95% Bootstrap-t UCL	0.0864
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.133
Kolmogorov-Smirnov Test Statistic	0.369	95% Percentile Bootstrap UCL	0.0627
Kolmogorov-Smirnov 5% Critical Value	0.0768	95% BCA Bootstrap UCL	0.0746
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0926
		97.5% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.158
95% Approximate Gamma UCL	0.051		
95% Adjusted Gamma UCL	0.0511		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.115

Result or 1/2 SDL (acenaphthylene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	79
Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.312
Maximum	1.2	Maximum of Log Data	0.182
Mean	0.042	Mean of log Data	-4.467
Median	0.0058	SD of log Data	1.213
SD	0.149		
Coefficient of Variation	3.543		
Skewness	6.646		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.402	Lilliefors Test Statistic	0.365
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0612	95% H-UCL	0.0299
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0364
95% Adjusted-CLT UCL	0.0674	97.5% Chebyshev (MVUE) UCL	0.0418
95% Modified-t UCL	0.0621	99% Chebyshev (MVUE) UCL	0.0526
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.486	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0865		
nu star	161.3		
Approximate Chi Square Value (.05)	133	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.061

Adjusted Chi Square Value	132.7	95% Jackknife UCL	0.0612
		95% Standard Bootstrap UCL	0.0608
Anderson-Darling Test Statistic	28.55	95% Bootstrap-t UCL	0.0779
Anderson-Darling 5% Critical Value	0.822	95% Hall's Bootstrap UCL	0.0621
Kolmogorov-Smirnov Test Statistic	0.375	95% Percentile Bootstrap UCL	0.0624
Kolmogorov-Smirnov 5% Critical Value	0.0767	95% BCA Bootstrap UCL	0.0687
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0924
		97.5% Chebyshev(Mean, Sd) UCL	0.114
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.157
95% Approximate Gamma UCL	0.051		
95% Adjusted Gamma UCL	0.0511		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.114

Result or 1/2 SDL (acetone)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	77
Raw Statistics		Log-transformed Statistics	
Minimum	8.5500E-5	Minimum of Log Data	-9.367
Maximum	0.16	Maximum of Log Data	-1.833
Mean	0.0145	Mean of log Data	-6.403
Median	0.0021	SD of log Data	2.342
SD	0.0317		
Coefficient of Variation	2.181		
Skewness	3.374		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.328	Lilliefors Test Statistic	0.26
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0203	95% H-UCL	0.0684
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0654
95% Adjusted-CLT UCL	0.0216	97.5% Chebyshev (MVUE) UCL	0.0838
95% Modified-t UCL	0.0205	99% Chebyshev (MVUE) UCL	0.12
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.312	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0466		
nu star	51.74		
Approximate Chi Square Value (.05)	36.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0202
Adjusted Chi Square Value	35.99	95% Jackknife UCL	0.0203
		95% Standard Bootstrap UCL	0.0204
Anderson-Darling Test Statistic	5.243	95% Bootstrap-t UCL	0.0229
Anderson-Darling 5% Critical Value	0.862	95% Hall's Bootstrap UCL	0.0216
Kolmogorov-Smirnov Test Statistic	0.246	95% Percentile Bootstrap UCL	0.0206

Kolmogorov-Smirnov 5% Critical Value		0.106	95% BCA Bootstrap UCL		0.0217
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0297
			97.5% Chebyshev(Mean, Sd) UCL		0.0362
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0491
95% Approximate Gamma UCL		0.0207			
95% Adjusted Gamma UCL		0.0209			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.0491
Result or 1/2 SDL (aluminum)					
General Statistics					
Number of Valid Samples		166	Number of Unique Samples		149
Raw Statistics			Log-transformed Statistics		
Minimum		414	Minimum of Log Data		6.026
Maximum		15700	Maximum of Log Data		9.661
Mean		6452	Mean of log Data		8.565
Median		6175	SD of log Data		0.718
SD		3601			
Coefficient of Variation		0.558			
Skewness		0.362			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.0643	Lilliefors Test Statistic		0.106
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data appear Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		6914	95% H-UCL		7566
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		8609
95% Adjusted-CLT UCL		6920	97.5% Chebyshev (MVUE) UCL		9402
95% Modified-t UCL		6916	99% Chebyshev (MVUE) UCL		10961
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		2.531	Data appear Normal at 5% Significance Level		
Theta Star		2550			
nu star		840.1			
Approximate Chi Square Value (.05)		773.9	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		6912
Adjusted Chi Square Value		773.3	95% Jackknife UCL		6914
			95% Standard Bootstrap UCL		6909
Anderson-Darling Test Statistic		1.49	95% Bootstrap-t UCL		6915
Anderson-Darling 5% Critical Value		0.762	95% Hall's Bootstrap UCL		6904
Kolmogorov-Smirnov Test Statistic		0.0875	95% Percentile Bootstrap UCL		6905
Kolmogorov-Smirnov 5% Critical Value		0.0731	95% BCA Bootstrap UCL		6915
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		7670
			97.5% Chebyshev(Mean, Sd) UCL		8197
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		9233
95% Approximate Gamma UCL		7004			

95% Adjusted Gamma UCL		7009		
Potential UCL to Use			Use 95% Student's-t UCL	6914
Result or 1/2 SDL (anthracene)				
General Statistics				
Number of Valid Samples		166	Number of Unique Samples 103	
Raw Statistics		Log-transformed Statistics		
Minimum	0.0049	Minimum of Log Data	-5.316	
Maximum	2.46	Maximum of Log Data	0.9	
Mean	0.0874	Mean of log Data	-4.023	
Median	0.0060	SD of log Data	1.563	
SD	0.254			
Coefficient of Variation	2.9			
Skewness	6.356			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Lilliefors Test Statistic	0.372	Lilliefors Test Statistic	0.273	
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688	
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.12	95% H-UCL	0.0843	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.105	
95% Adjusted-CLT UCL	0.13	97.5% Chebyshev (MVUE) UCL	0.125	
95% Modified-t UCL	0.122	99% Chebyshev (MVUE) UCL	0.164	
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.409	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.214			
nu star	135.9			
Approximate Chi Square Value (.05)	110	Nonparametric Statistics		
Adjusted Level of Significance	0.0486	95% CLT UCL	0.12	
Adjusted Chi Square Value	109.8	95% Jackknife UCL	0.12	
		95% Standard Bootstrap UCL	0.12	
Anderson-Darling Test Statistic	20.06	95% Bootstrap-t UCL	0.142	
Anderson-Darling 5% Critical Value	0.841	95% Hall's Bootstrap UCL	0.173	
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	0.122	
Kolmogorov-Smirnov 5% Critical Value	0.0775	95% BCA Bootstrap UCL	0.136	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.173	
		97.5% Chebyshev(Mean, Sd) UCL	0.21	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.283	
95% Approximate Gamma UCL	0.108			
95% Adjusted Gamma UCL	0.108			
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.21	

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[100](#)

Number of Valid Samples		166	Number of Unique Samples		83
Raw Statistics			Log-transformed Statistics		
	Minimum	0.095		Minimum of Log Data	-2.354
	Maximum	5.51		Maximum of Log Data	1.707
	Mean	1.023		Mean of log Data	-0.654
	Median	0.24		SD of log Data	1.192
	SD	1.14			
	Coefficient of Variation	1.114			
	Skewness	1.329			

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.291	Lilliefors Test Statistic	0.262
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.17	95% H-UCL	1.313
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.594
95% Adjusted-CLT UCL	1.179	97.5% Chebyshev (MVUE) UCL	1.829
95% Modified-t UCL	1.171	99% Chebyshev (MVUE) UCL	2.291
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.856	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.196		
nu star	284.1		
Approximate Chi Square Value (.05)	246	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	1.169
Adjusted Chi Square Value	245.7	95% Jackknife UCL	1.17
		95% Standard Bootstrap UCL	1.169
Anderson-Darling Test Statistic	12.23	95% Bootstrap-t UCL	1.179
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	1.185
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL	1.179
Kolmogorov-Smirnov 5% Critical Value	0.0749	95% BCA Bootstrap UCL	1.169
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.409
		97.5% Chebyshev(Mean, Sd) UCL	1.576
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.904
95% Approximate Gamma UCL	1.182		
95% Adjusted Gamma UCL	1.183		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	1.576

Result or 1/2 SDL (aroclor-1254)

General Statistics

Number of Valid Samples	174	Number of Unique Samples	115
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Raw Statistics			Log-transformed Statistics		
	Minimum	0.0016		Minimum of Log Data	-6.422
	Maximum	11.5		Maximum of Log Data	2.442
	Mean	0.205		Mean of log Data	-5.38
	Median	0.0019		SD of log Data	1.955
	SD	1.131			
	Coefficient of Variation	5.523			
	Skewness	8.01			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.443		Lilliefors Test Statistic	0.402
	Lilliefors Critical Value	0.0672		Lilliefors Critical Value	0.0672
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.347		95% H-UCL	0.0496
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0618
	95% Adjusted-CLT UCL	0.401		97.5% Chebyshev (MVUE) UCL	0.0754
	95% Modified-t UCL	0.355		99% Chebyshev (MVUE) UCL	0.102
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.195	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	1.049			
	nu star	67.95			
	Approximate Chi Square Value (.05)	49.98	Nonparametric Statistics		
	Adjusted Level of Significance	0.0486		95% CLT UCL	0.346
	Adjusted Chi Square Value	49.85		95% Jackknife UCL	0.347
				95% Standard Bootstrap UCL	0.344
	Anderson-Darling Test Statistic	46.09		95% Bootstrap-t UCL	0.573
	Anderson-Darling 5% Critical Value	0.922		95% Hall's Bootstrap UCL	0.86
	Kolmogorov-Smirnov Test Statistic	0.437		95% Percentile Bootstrap UCL	0.36
	Kolmogorov-Smirnov 5% Critical Value	0.0782		95% BCA Bootstrap UCL	0.439
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.578
				97.5% Chebyshev(Mean, Sd) UCL	0.74
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	1.058
	95% Approximate Gamma UCL	0.278			
	95% Adjusted Gamma UCL	0.279			
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL	0.74

Result or 1/2 SDL (arsenic)

General Statistics					
	Number of Valid Samples	166		Number of Unique Samples	146
Raw Statistics			Log-transformed Statistics		
	Minimum	0.085		Minimum of Log Data	-2.465
	Maximum	24.3		Maximum of Log Data	3.19
	Mean	3.331		Mean of log Data	0.67
	Median	2.68		SD of log Data	1.225

SD	3.269		
Coefficient of Variation	0.981		
Skewness	2.631		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.16	Lilliefors Test Statistic	0.155
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.751	95% H-UCL	5.182
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.311
95% Adjusted-CLT UCL	3.804	97.5% Chebyshev (MVUE) UCL	7.266
95% Modified-t UCL	3.76	99% Chebyshev (MVUE) UCL	9.141
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.057	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.15		
nu star	351.1		
Approximate Chi Square Value (.05)	308.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	3.749
Adjusted Chi Square Value	308.3	95% Jackknife UCL	3.751
		95% Standard Bootstrap UCL	3.736
Anderson-Darling Test Statistic	1.15	95% Bootstrap-t UCL	3.826
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	3.838
Kolmogorov-Smirnov Test Statistic	0.0872	95% Percentile Bootstrap UCL	3.765
Kolmogorov-Smirnov 5% Critical Value	0.0744	95% BCA Bootstrap UCL	3.782
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.437
		97.5% Chebyshev(Mean, Sd) UCL	4.916
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.856
95% Approximate Gamma UCL	3.789		
95% Adjusted Gamma UCL	3.793		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	4.916

Result or 1/2 SDL (barium)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	135
Raw Statistics		Log-transformed Statistics	
Minimum	18.6	Minimum of Log Data	2.923
Maximum	2180	Maximum of Log Data	7.687
Mean	237.4	Mean of log Data	5.104
Median	139.5	SD of log Data	0.789
SD	274.8		
Coefficient of Variation	1.158		
Skewness	3.69		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Lilliefors Test Statistic		0.276		Lilliefors Test Statistic		0.126	
Lilliefors Critical Value		0.0688		Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		272.7		95% H-UCL		254.2	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			
95% Adjusted-CLT UCL		279		97.5% Chebyshev (MVUE) UCL		321.9	
95% Modified-t UCL		273.7		99% Chebyshev (MVUE) UCL		379.8	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		1.489		Data do not follow a Discernable Distribution (0.05)			
Theta Star		159.4					
nu star		494.5					
Approximate Chi Square Value (.05)		443.9		Nonparametric Statistics			
Adjusted Level of Significance		0.0486		95% CLT UCL		272.5	
Adjusted Chi Square Value		443.5		95% Jackknife UCL		272.7	
				95% Standard Bootstrap UCL		271.5	
Anderson-Darling Test Statistic		7.901		95% Bootstrap-t UCL		282.1	
Anderson-Darling 5% Critical Value		0.771		95% Hall's Bootstrap UCL		283.4	
Kolmogorov-Smirnov Test Statistic		0.186		95% Percentile Bootstrap UCL		274.8	
Kolmogorov-Smirnov 5% Critical Value		0.0738		95% BCA Bootstrap UCL		279.3	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		330.4	
				97.5% Chebyshev(Mean, Sd) UCL		370.6	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		449.6	
95% Approximate Gamma UCL		264.4					
95% Adjusted Gamma UCL		264.7					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		330.4	
Result or 1/2 SDL (benzene)							
General Statistics							
Number of Valid Samples		83		Number of Unique Samples		78	
Raw Statistics				Log-transformed Statistics			
Minimum		4.7500E-5		Minimum of Log Data		-9.955	
Maximum		0.0221		Maximum of Log Data		-3.812	
Mean		0.0040		Mean of log Data		-5.975	
Median		0.0032		SD of log Data		1.26	
SD		0.0036					
Coefficient of Variation		0.883					
Skewness		2.64					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Lilliefors Test Statistic		0.135		Lilliefors Test Statistic		0.182	
Lilliefors Critical Value		0.0973		Lilliefors Critical Value		0.0973	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			

Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL		0.0047		95% H-UCL		0.0079		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL				0.0098
95% Adjusted-CLT UCL		0.0048		97.5% Chebyshev (MVUE) UCL		0.0117		
95% Modified-t UCL		0.0047		99% Chebyshev (MVUE) UCL		0.0153		
Gamma Distribution Test				Data Distribution				
k star (bias corrected)		1.16		Data do not follow a Discernable Distribution (0.05)				
Theta Star		0.0035						
nu star		192.5						
Approximate Chi Square Value (.05)		161.4		Nonparametric Statistics				
Adjusted Level of Significance		0.0471		95% CLT UCL		0.0047		
Adjusted Chi Square Value		160.9		95% Jackknife UCL		0.0047		
				95% Standard Bootstrap UCL		0.0047		
Anderson-Darling Test Statistic		1.58		95% Bootstrap-t UCL		0.0049		
Anderson-Darling 5% Critical Value		0.778		95% Hall's Bootstrap UCL		0.0050		
Kolmogorov-Smirnov Test Statistic		0.114		95% Percentile Bootstrap UCL		0.0047		
Kolmogorov-Smirnov 5% Critical Value		0.101		95% BCA Bootstrap UCL		0.0049		
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0058		
				97.5% Chebyshev(Mean, Sd) UCL		0.0065		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0080		
95% Approximate Gamma UCL		0.0048						
95% Adjusted Gamma UCL		0.0048						
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL		0.0065		
Result or 1/2 SDL (benzo(a)anthracene)								
General Statistics								
Number of Valid Samples		166		Number of Unique Samples		110		
Raw Statistics				Log-transformed Statistics				
Minimum		0.0044		Minimum of Log Data		-5.415		
Maximum		5.02		Maximum of Log Data		1.613		
Mean		0.268		Mean of log Data		-3.885		
Median		0.0054		SD of log Data		2.05		
SD		0.765						
Coefficient of Variation		2.854						
Skewness		4.224						
Relevant UCL Statistics								
Normal Distribution Test				Lognormal Distribution Test				
Lilliefors Test Statistic		0.395		Lilliefors Test Statistic		0.315		
Lilliefors Critical Value		0.0688		Lilliefors Critical Value		0.0688		
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL		0.366		95% H-UCL		0.281		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.347		
95% Adjusted-CLT UCL		0.386		97.5% Chebyshev (MVUE) UCL		0.427		
95% Modified-t UCL		0.369		99% Chebyshev (MVUE) UCL		0.584		

Gamma Distribution Test				Data Distribution									
k star (bias corrected)		0.272		Data do not follow a Discernable Distribution (0.05)									
Theta Star		0.986											
nu star		90.22											
Approximate Chi Square Value (.05)		69.32		Nonparametric Statistics									
Adjusted Level of Significance		0.0486		95% CLT UCL				0.366					
Adjusted Chi Square Value		69.16		95% Jackknife UCL				0.366					
				95% Standard Bootstrap UCL				0.362					
Anderson-Darling Test Statistic		26.03		95% Bootstrap-t UCL				0.399					
Anderson-Darling 5% Critical Value		0.881		95% Hall's Bootstrap UCL				0.394					
Kolmogorov-Smirnov Test Statistic		0.324		95% Percentile Bootstrap UCL				0.37					
Kolmogorov-Smirnov 5% Critical Value		0.0791		95% BCA Bootstrap UCL				0.385					
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL				0.527					
				97.5% Chebyshev(Mean, Sd) UCL				0.639					
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL				0.859					
95% Approximate Gamma UCL		0.349											
95% Adjusted Gamma UCL		0.35											
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL				0.859					

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	137
Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.419
Maximum	4.88	Maximum of Log Data	1.585
Mean	0.347	Mean of log Data	-3.193
Median	0.0253	SD of log Data	2.033
SD	0.856		
Coefficient of Variation	2.468		
Skewness	3.524		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.348	Lilliefors Test Statistic	0.137
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.457	95% H-UCL	0.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.666
95% Adjusted-CLT UCL	0.475	97.5% Chebyshev (MVUE) UCL	0.819
95% Modified-t UCL	0.46	99% Chebyshev (MVUE) UCL	1.12
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.318	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.09		
nu star	105.6		

Approximate Chi Square Value (.05)		82.89	Nonparametric Statistics	
Adjusted Level of Significance		0.0486	95% CLT UCL	0.456
Adjusted Chi Square Value		82.71	95% Jackknife UCL	0.457
			95% Standard Bootstrap UCL	0.456
Anderson-Darling Test Statistic		13.58	95% Bootstrap-t UCL	0.481
Anderson-Darling 5% Critical Value		0.864	95% Hall's Bootstrap UCL	0.476
Kolmogorov-Smirnov Test Statistic		0.217	95% Percentile Bootstrap UCL	0.46
Kolmogorov-Smirnov 5% Critical Value		0.0784	95% BCA Bootstrap UCL	0.482
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.636
			97.5% Chebyshev(Mean, Sd) UCL	0.762
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	1.008
95% Approximate Gamma UCL		0.442		
95% Adjusted Gamma UCL		0.443		
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	1.008
Result or 1/2 SDL (benzo(b)fluoranthene)				
General Statistics				
Number of Valid Samples		166	Number of Unique Samples	145
Raw Statistics			Log-transformed Statistics	
Minimum		0.0033	Minimum of Log Data	-5.688
Maximum		5.97	Maximum of Log Data	1.787
Mean		0.466	Mean of log Data	-2.669
Median		0.0825	SD of log Data	2.179
SD		1.023		
Coefficient of Variation		2.192		
Skewness		3.432		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Lilliefors Test Statistic		0.325	Lilliefors Test Statistic	0.16
Lilliefors Critical Value		0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL		0.598	95% H-UCL	1.322
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	1.605
95% Adjusted-CLT UCL		0.62	97.5% Chebyshev (MVUE) UCL	1.992
95% Modified-t UCL		0.601	99% Chebyshev (MVUE) UCL	2.752
Gamma Distribution Test			Data Distribution	
k star (bias corrected)		0.35	Data do not follow a Discernable Distribution (0.05)	
Theta Star		1.332		
nu star		116.2		
Approximate Chi Square Value (.05)		92.33	Nonparametric Statistics	
Adjusted Level of Significance		0.0486	95% CLT UCL	0.597
Adjusted Chi Square Value		92.15	95% Jackknife UCL	0.598
			95% Standard Bootstrap UCL	0.6
Anderson-Darling Test Statistic		6.109	95% Bootstrap-t UCL	0.629

Anderson-Darling 5% Critical Value	0.856	95% Hall's Bootstrap UCL	0.624
Kolmogorov-Smirnov Test Statistic	0.144	95% Percentile Bootstrap UCL	0.604
Kolmogorov-Smirnov 5% Critical Value	0.0781	95% BCA Bootstrap UCL	0.609
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.812
		97.5% Chebyshev(Mean, Sd) UCL	0.962
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.256
95% Approximate Gamma UCL	0.587		
95% Adjusted Gamma UCL	0.588		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.256

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	125
Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.418
Maximum	4.24	Maximum of Log Data	1.445
Mean	0.251	Mean of log Data	-3.365
Median	0.026	SD of log Data	1.982
SD	0.606		
Coefficient of Variation	2.415		
Skewness	3.815		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.342	Lilliefors Test Statistic	0.221
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.329	95% H-UCL	0.401
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.497
95% Adjusted-CLT UCL	0.343	97.5% Chebyshev (MVUE) UCL	0.609
95% Modified-t UCL	0.331	99% Chebyshev (MVUE) UCL	0.83
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.338	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.742		
nu star	112.4		
Approximate Chi Square Value (.05)	88.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.328
Adjusted Chi Square Value	88.72	95% Jackknife UCL	0.329
		95% Standard Bootstrap UCL	0.331
Anderson-Darling Test Statistic	13.2	95% Bootstrap-t UCL	0.352
Anderson-Darling 5% Critical Value	0.859	95% Hall's Bootstrap UCL	0.347
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	0.329
Kolmogorov-Smirnov 5% Critical Value	0.0782	95% BCA Bootstrap UCL	0.342
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.456
		97.5% Chebyshev(Mean, Sd) UCL	0.545

Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.719
95% Approximate Gamma UCL		0.317				
95% Adjusted Gamma UCL		0.318				
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL			0.545
Result or 1/2 SDL (benzo(k)fluoranthene)						
General Statistics						
Number of Valid Samples		166	Number of Unique Samples		92	
Raw Statistics			Log-transformed Statistics			
Minimum		0.0068	Minimum of Log Data		-4.984	
Maximum		4.25	Maximum of Log Data		1.447	
Mean		0.157	Mean of log Data		-3.763	
Median		0.0082	SD of log Data		1.667	
SD		0.457				
Coefficient of Variation		2.917				
Skewness		5.523				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Lilliefors Test Statistic		0.372	Lilliefors Test Statistic		0.335	
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.215	95% H-UCL		0.134	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.168	
95% Adjusted-CLT UCL		0.231	97.5% Chebyshev (MVUE) UCL		0.201	
95% Modified-t UCL		0.218	99% Chebyshev (MVUE) UCL		0.266	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.35	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.448				
nu star		116.1				
Approximate Chi Square Value (.05)		92.22	Nonparametric Statistics			
Adjusted Level of Significance		0.0486	95% CLT UCL		0.215	
Adjusted Chi Square Value		92.03	95% Jackknife UCL		0.215	
			95% Standard Bootstrap UCL		0.212	
Anderson-Darling Test Statistic		26.6	95% Bootstrap-t UCL		0.241	
Anderson-Darling 5% Critical Value		0.856	95% Hall's Bootstrap UCL		0.263	
Kolmogorov-Smirnov Test Statistic		0.344	95% Percentile Bootstrap UCL		0.219	
Kolmogorov-Smirnov 5% Critical Value		0.0781	95% BCA Bootstrap UCL		0.234	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.311	
			97.5% Chebyshev(Mean, Sd) UCL		0.378	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.509	
95% Approximate Gamma UCL		0.197				
95% Adjusted Gamma UCL		0.197				
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.378	

Result or 1/2 SDL (beryllium)			
General Statistics			
Number of Valid Samples	166	Number of Unique Samples	86
Raw Statistics		Log-transformed Statistics	
Minimum	0.0015	Minimum of Log Data	-6.47
Maximum	4.6	Maximum of Log Data	1.526
Mean	0.465	Mean of log Data	-1.111
Median	0.415	SD of log Data	1.003
SD	0.42		
Coefficient of Variation	0.903		
Skewness	5.93		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.153	Lilliefors Test Statistic	0.151
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.519	95% H-UCL	0.644
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.764
95% Adjusted-CLT UCL	0.534	97.5% Chebyshev (MVUE) UCL	0.86
95% Modified-t UCL	0.521	99% Chebyshev (MVUE) UCL	1.049
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.57	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.296		
nu star	521.2		
Approximate Chi Square Value (.05)	469.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.518
Adjusted Chi Square Value	468.9	95% Jackknife UCL	0.519
		95% Standard Bootstrap UCL	0.518
Anderson-Darling Test Statistic	2.638	95% Bootstrap-t UCL	0.544
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	0.772
Kolmogorov-Smirnov Test Statistic	0.0955	95% Percentile Bootstrap UCL	0.52
Kolmogorov-Smirnov 5% Critical Value	0.0737	95% BCA Bootstrap UCL	0.535
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.607
		97.5% Chebyshev(Mean, Sd) UCL	0.668
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.789
95% Approximate Gamma UCL	0.516		
95% Adjusted Gamma UCL	0.517		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.668
Result or 1/2 SDL (biphenyl)			
General Statistics			

Number of Valid Samples		166	Number of Unique Samples		69
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0049		Minimum of Log Data	-5.318
	Maximum	1.02		Maximum of Log Data	0.0198
	Mean	0.0219		Mean of log Data	-4.728
	Median	0.0057		SD of log Data	0.949
	SD	0.085			
	Coefficient of Variation	3.873			
	Skewness	10.41			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.421		Lilliefors Test Statistic	0.405
	Lilliefors Critical Value	0.0688		Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.0328		95% H-UCL	0.0162
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0191
	95% Adjusted-CLT UCL	0.0385		97.5% Chebyshev (MVUE) UCL	0.0214
	95% Modified-t UCL	0.0337		99% Chebyshev (MVUE) UCL	0.0259
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.662	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.0332			
	nu star	219.7			
	Approximate Chi Square Value (.05)	186.4	Nonparametric Statistics		
	Adjusted Level of Significance	0.0486		95% CLT UCL	0.0328
	Adjusted Chi Square Value	186.1		95% Jackknife UCL	0.0328
				95% Standard Bootstrap UCL	0.0328
	Anderson-Darling Test Statistic	33.77		95% Bootstrap-t UCL	0.0641
	Anderson-Darling 5% Critical Value	0.804		95% Hall's Bootstrap UCL	0.0786
	Kolmogorov-Smirnov Test Statistic	0.43		95% Percentile Bootstrap UCL	0.0344
	Kolmogorov-Smirnov 5% Critical Value	0.0757		95% BCA Bootstrap UCL	0.0415
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0507
Assuming Gamma Distribution				97.5% Chebyshev(Mean, Sd) UCL	0.0631
	95% Approximate Gamma UCL	0.0259		99% Chebyshev(Mean, Sd) UCL	0.0875
	95% Adjusted Gamma UCL	0.0259			
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL	0.0507

Result or 1/2 SDL (boron)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		114
Raw Statistics			Log-transformed Statistics		
	Minimum	0.475		Minimum of Log Data	-0.744
	Maximum	54.4		Maximum of Log Data	3.996

Mean	4.811	Mean of log Data	0.742
Median	1.475	SD of log Data	1.361
SD	6.242		
Coefficient of Variation	1.298		
Skewness	3.515		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.244	Lilliefors Test Statistic	0.253
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.612	95% H-UCL	6.904
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.515
95% Adjusted-CLT UCL	5.749	97.5% Chebyshev (MVUE) UCL	9.929
95% Modified-t UCL	5.634	99% Chebyshev (MVUE) UCL	12.71
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.716	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.716		
nu star	237.8		
Approximate Chi Square Value (.05)	203.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	5.608
Adjusted Chi Square Value	202.9	95% Jackknife UCL	5.612
		95% Standard Bootstrap UCL	5.63
Anderson-Darling Test Statistic	11.51	95% Bootstrap-t UCL	5.814
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	5.949
Kolmogorov-Smirnov Test Statistic	0.252	95% Percentile Bootstrap UCL	5.594
Kolmogorov-Smirnov 5% Critical Value	0.0754	95% BCA Bootstrap UCL	5.756
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.923
		97.5% Chebyshev(Mean, Sd) UCL	7.837
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.632
95% Approximate Gamma UCL	5.633		
95% Adjusted Gamma UCL	5.64		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	7.837

Result or 1/2 SDL (butyl benzyl phthalate)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	69
Raw Statistics		Log-transformed Statistics	
Minimum	0.0054	Minimum of Log Data	-5.212
Maximum	0.617	Maximum of Log Data	-0.483
Mean	0.0203	Mean of log Data	-4.633
Median	0.0064	SD of log Data	0.906
SD	0.0558		
Coefficient of Variation	2.752		
Skewness	8.42		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.395	Lilliefors Test Statistic	0.392
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0274	95% H-UCL	0.017
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0199
95% Adjusted-CLT UCL	0.0304	97.5% Chebyshev (MVUE) UCL	0.0222
95% Modified-t UCL	0.0279	99% Chebyshev (MVUE) UCL	0.0266
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.797	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0255		
nu star	264.5		
Approximate Chi Square Value (.05)	227.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0274
Adjusted Chi Square Value	227.5	95% Jackknife UCL	0.0274
		95% Standard Bootstrap UCL	0.0273
Anderson-Darling Test Statistic	32.49	95% Bootstrap-t UCL	0.0361
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	0.058
Kolmogorov-Smirnov Test Statistic	0.418	95% Percentile Bootstrap UCL	0.0288
Kolmogorov-Smirnov 5% Critical Value	0.0751	95% BCA Bootstrap UCL	0.0313
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0392
		97.5% Chebyshev(Mean, Sd) UCL	0.0473
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0634
95% Approximate Gamma UCL	0.0235		
95% Adjusted Gamma UCL	0.0236		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0392
Result or 1/2 SDL (cadmium)			
General Statistics			
Number of Valid Samples	166	Number of Unique Samples	76
Raw Statistics		Log-transformed Statistics	
Minimum	0.0085	Minimum of Log Data	-4.768
Maximum	9.71	Maximum of Log Data	2.273
Mean	0.335	Mean of log Data	-2.576
Median	0.11	SD of log Data	1.888
SD	0.859		
Coefficient of Variation	2.561		
Skewness	8.46		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.352	Lilliefors Test Statistic	0.227
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.446		95% H-UCL		0.709	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			
95% Adjusted-CLT UCL		0.492		97.5% Chebyshev (MVUE) UCL		1.077	
95% Modified-t UCL		0.453		99% Chebyshev (MVUE) UCL		1.454	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.433		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.773					
nu star		143.9					
Approximate Chi Square Value (.05)		117.2		Nonparametric Statistics			
Adjusted Level of Significance		0.0486		95% CLT UCL		0.445	
Adjusted Chi Square Value		117		95% Jackknife UCL		0.446	
				95% Standard Bootstrap UCL		0.446	
Anderson-Darling Test Statistic		8.005		95% Bootstrap-t UCL		0.55	
Anderson-Darling 5% Critical Value		0.835		95% Hall's Bootstrap UCL		0.893	
Kolmogorov-Smirnov Test Statistic		0.204		95% Percentile Bootstrap UCL		0.452	
Kolmogorov-Smirnov 5% Critical Value		0.0772		95% BCA Bootstrap UCL		0.511	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.626	
				97.5% Chebyshev(Mean, Sd) UCL		0.751	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.998	
95% Approximate Gamma UCL		0.412					
95% Adjusted Gamma UCL		0.412					
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL		0.751	

Result or 1/2 SDL (carbazole)

General Statistics			
Number of Valid Samples		166	Number of Unique Samples 112
Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.444
Maximum	1.54	Maximum of Log Data	0.432
Mean	0.0459	Mean of log Data	-4.438
Median	0.0052	SD of log Data	1.335
SD	0.148		
Coefficient of Variation	3.227		
Skewness	7.508		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.389	Lilliefors Test Statistic	0.328
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		95% H-UCL	0.0372
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0458

95% Adjusted-CLT UCL	0.0719	97.5% Chebyshev (MVUE) UCL	0.0533
95% Modified-t UCL	0.066	99% Chebyshev (MVUE) UCL	0.068
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.468	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0981		
nu star	155.3		
Approximate Chi Square Value (.05)	127.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0648
Adjusted Chi Square Value	127.3	95% Jackknife UCL	0.0649
		95% Standard Bootstrap UCL	0.0653
Anderson-Darling Test Statistic	24.68	95% Bootstrap-t UCL	0.0833
Anderson-Darling 5% Critical Value	0.827	95% Hall's Bootstrap UCL	0.137
Kolmogorov-Smirnov Test Statistic	0.334	95% Percentile Bootstrap UCL	0.0656
Kolmogorov-Smirnov 5% Critical Value	0.0769	95% BCA Bootstrap UCL	0.0769
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.096
		97.5% Chebyshev(Mean, Sd) UCL	0.118
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.16
95% Approximate Gamma UCL	0.0559		
95% Adjusted Gamma UCL	0.056		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.118

Result or 1/2 SDL (carbon disulfide)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	52
Raw Statistics		Log-transformed Statistics	
Minimum	2.5000E-5	Minimum of Log Data	-10.6
Maximum	0.028	Maximum of Log Data	-3.576
Mean	0.0012	Mean of log Data	-8.944
Median	5.1000E-5	SD of log Data	1.844
SD	0.0039		
Coefficient of Variation	3.144		
Skewness	5.355		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.387	Lilliefors Test Statistic	0.389
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0019	95% H-UCL	0.0013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0022	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0020	99% Chebyshev (MVUE) UCL	0.0027
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.3	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0042		
nu star	49.81		
Approximate Chi Square Value (.05)	34.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0019
Adjusted Chi Square Value	34.38	95% Jackknife UCL	0.0019
		95% Standard Bootstrap UCL	0.0019
Anderson-Darling Test Statistic	16.26	95% Bootstrap-t UCL	0.0031
Anderson-Darling 5% Critical Value	0.865	95% Hall's Bootstrap UCL	0.0053
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0020
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0023
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0031
		97.5% Chebyshev(Mean, Sd) UCL	0.004
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0056
95% Approximate Gamma UCL	0.0018		
95% Adjusted Gamma UCL	0.0018		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.004

Result or 1/2 SDL (chromium)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	144
Raw Statistics		Log-transformed Statistics	
Minimum	2.03	Minimum of Log Data	0.708
Maximum	136	Maximum of Log Data	4.913
Mean	13.53	Mean of log Data	2.41
Median	10.55	SD of log Data	0.582
SD	12.49		
Coefficient of Variation	0.923		
Skewness	6.346		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.215	Lilliefors Test Statistic	0.0792
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.13	95% H-UCL	14.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.96
95% Adjusted-CLT UCL	15.63	97.5% Chebyshev (MVUE) UCL	17.17
95% Modified-t UCL	15.21	99% Chebyshev (MVUE) UCL	19.54
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.677	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.053		
nu star	888.9		
Approximate Chi Square Value (.05)	820.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	15.12
Adjusted Chi Square Value	820.1	95% Jackknife UCL	15.13

[illegible]

Result or 1/2 SDL (chrysene)

General Statistics

Number of Valid Samples		166	Number of Unique Samples		151
Raw Statistics			Log-transformed Statistics		
Minimum	0.0042		Minimum of Log Data	-5.47	
Maximum	4.87		Maximum of Log Data	1.583	
Mean	0.327		Mean of log Data	-3.244	
Median	0.0291		SD of log Data	2.065	
SD	0.79				
Coefficient of Variation	2.415				
Skewness	3.488				

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.347	Lilliefors Test Statistic	0.14
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.429	95% H-UCL	0.555
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.683
95% Adjusted-CLT UCL	0.446	97.5% Chebyshev (MVUE) UCL	0.841
95% Modified-t UCL	0.432	99% Chebyshev (MVUE) UCL	1.153
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.319	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.027		
nu star	105.9		
Approximate Chi Square Value (.05)	83.11	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.428
Adjusted Chi Square Value	82.93	95% Jackknife UCL	0.429
		95% Standard Bootstrap UCL	0.43
Anderson-Darling Test Statistic	12.67	95% Bootstrap-t UCL	0.449
Anderson-Darling 5% Critical Value	0.864	95% Hall's Bootstrap UCL	0.452
Kolmogorov-Smirnov Test Statistic	0.207	95% Percentile Bootstrap UCL	0.438
Kolmogorov-Smirnov 5% Critical Value	0.0784	95% BCA Bootstrap UCL	0.453

Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.595
				97.5% Chebyshev(Mean, Sd) UCL		0.711
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.938
95% Approximate Gamma UCL		0.417				
95% Adjusted Gamma UCL		0.418				
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.938
Result or 1/2 SDL (cobalt)						
General Statistics						
Number of Valid Samples		166	Number of Unique Samples		146	
Raw Statistics			Log-transformed Statistics			
Minimum		0.0125	Minimum of Log Data		-4.382	
Maximum		16	Maximum of Log Data		2.773	
Mean		4.144	Mean of log Data		1.255	
Median		3.965	SD of log Data		0.754	
SD		2.047				
Coefficient of Variation		0.494				
Skewness		1.346				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Lilliefors Test Statistic		0.0667	Lilliefors Test Statistic		0.143	
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688	
Data appear Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		4.407	95% H-UCL		5.234	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		5.989	
95% Adjusted-CLT UCL		4.423	97.5% Chebyshev (MVUE) UCL		6.567	
95% Modified-t UCL		4.41	99% Chebyshev (MVUE) UCL		7.703	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		3.105	Data appear Normal at 5% Significance Level			
Theta Star		1.335				
nu star		1031				
Approximate Chi Square Value (.05)		957.4	Nonparametric Statistics			
Adjusted Level of Significance		0.0486	95% CLT UCL		4.406	
Adjusted Chi Square Value		956.8	95% Jackknife UCL		4.407	
			95% Standard Bootstrap UCL		4.41	
Anderson-Darling Test Statistic		2.317	95% Bootstrap-t UCL		4.422	
Anderson-Darling 5% Critical Value		0.759	95% Hall's Bootstrap UCL		4.447	
Kolmogorov-Smirnov Test Statistic		0.0839	95% Percentile Bootstrap UCL		4.392	
Kolmogorov-Smirnov 5% Critical Value		0.0729	95% BCA Bootstrap UCL		4.432	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		4.837	
			97.5% Chebyshev(Mean, Sd) UCL		5.137	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		5.725	
95% Approximate Gamma UCL		4.462				
95% Adjusted Gamma UCL		4.465				

Potential UCL to Use				Use 95% Student's-t UCL			
				4.407			
Result or 1/2 SDL (copper)							
General Statistics							
Number of Valid Samples		166		Number of Unique Samples		147	
Raw Statistics				Log-transformed Statistics			
Minimum		0.033		Minimum of Log Data		-3.411	
Maximum		487		Maximum of Log Data		6.188	
Mean		24.26		Mean of log Data		2.524	
Median		11.85		SD of log Data		1.207	
SD		46.76					
Coefficient of Variation		1.928					
Skewness		6.907					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Lilliefors Test Statistic		0.302		Lilliefors Test Statistic		0.17	
Lilliefors Critical Value		0.0688		Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		30.26		95% H-UCL		32.22	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		39.17	
95% Adjusted-CLT UCL		32.31		97.5% Chebyshev (MVUE) UCL		45.02	
95% Modified-t UCL		30.58		99% Chebyshev (MVUE) UCL		56.5	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.87		Data do not follow a Discernable Distribution (0.05)			
Theta Star		27.89					
nu star		288.8					
Approximate Chi Square Value (.05)		250.4		Nonparametric Statistics			
Adjusted Level of Significance		0.0486		95% CLT UCL		30.23	
Adjusted Chi Square Value		250.1		95% Jackknife UCL		30.26	
				95% Standard Bootstrap UCL		30.08	
Anderson-Darling Test Statistic		7.347		95% Bootstrap-t UCL		34.38	
Anderson-Darling 5% Critical Value		0.789		95% Hall's Bootstrap UCL		54.38	
Kolmogorov-Smirnov Test Statistic		0.163		95% Percentile Bootstrap UCL		30.56	
Kolmogorov-Smirnov 5% Critical Value		0.0749		95% BCA Bootstrap UCL		33.9	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		40.08	
				97.5% Chebyshev(Mean, Sd) UCL		46.92	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		60.37	
95% Approximate Gamma UCL		27.97					
95% Adjusted Gamma UCL		28.01					
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL		46.92	
Result or 1/2 SDL (cyclohexane)							

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		74
Raw Statistics			Log-transformed Statistics		
Minimum		4.4350E-4	Minimum of Log Data		-7.721
Maximum		21.7	Maximum of Log Data		3.077
Mean		0.266	Mean of log Data		-6.38
Median		0.0014	SD of log Data		1.598
SD		2.381			
Coefficient of Variation		8.952			
Skewness		9.11			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.517	Lilliefors Test Statistic		0.265
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.701	95% H-UCL		0.0101
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0122
95% Adjusted-CLT UCL		0.975	97.5% Chebyshev (MVUE) UCL		0.0149
95% Modified-t UCL		0.744	99% Chebyshev (MVUE) UCL		0.0203
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.154	Data do not follow a Discernable Distribution (0.05)		
Theta Star		1.724			
nu star		25.61			
Approximate Chi Square Value (.05)		15.08	Nonparametric Statistics		
Adjusted Level of Significance		0.0471	95% CLT UCL		0.696
Adjusted Chi Square Value		14.94	95% Jackknife UCL		0.701
			95% Standard Bootstrap UCL		0.692
Anderson-Darling Test Statistic		25.11	95% Bootstrap-t UCL		98.46
Anderson-Darling 5% Critical Value		0.956	95% Hall's Bootstrap UCL		48.51
Kolmogorov-Smirnov Test Statistic		0.433	95% Percentile Bootstrap UCL		0.789
Kolmogorov-Smirnov 5% Critical Value		0.11	95% BCA Bootstrap UCL		1.052
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		1.405
			97.5% Chebyshev(Mean, Sd) UCL		1.898
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		2.867
95% Approximate Gamma UCL		0.452			
95% Adjusted Gamma UCL		0.456			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		1.898

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		130
Raw Statistics			Log-transformed Statistics		

Minimum	0.0042	Minimum of Log Data	-5.466
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.113	Mean of log Data	-3.906
Median	0.0052	SD of log Data	1.817
SD	0.252		
Coefficient of Variation	2.229		
Skewness	3.609		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.333	Lilliefors Test Statistic	0.325
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.146	95% H-UCL	0.159
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.199
95% Adjusted-CLT UCL	0.151	97.5% Chebyshev (MVUE) UCL	0.242
95% Modified-t UCL	0.147	99% Chebyshev (MVUE) UCL	0.324
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.298		
nu star	126.3		
Approximate Chi Square Value (.05)	101.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.145
Adjusted Chi Square Value	101.2	95% Jackknife UCL	0.146
		95% Standard Bootstrap UCL	0.146
Anderson-Darling Test Statistic	18.02	95% Bootstrap-t UCL	0.153
Anderson-Darling 5% Critical Value	0.848	95% Hall's Bootstrap UCL	0.151
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	0.148
Kolmogorov-Smirnov 5% Critical Value	0.0778	95% BCA Bootstrap UCL	0.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.199
		97.5% Chebyshev(Mean, Sd) UCL	0.236
		99% Chebyshev(Mean, Sd) UCL	0.308
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.141		
95% Adjusted Gamma UCL	0.141		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.236

Result or 1/2 SDL (dibenzofuran)

General Statistics

Number of Valid Samples		166	Number of Unique Samples		77
Raw Statistics			Log-transformed Statistics		
Minimum	0.0062		Minimum of Log Data	-5.083	
Maximum	0.821		Maximum of Log Data	-0.197	
Mean	0.0309		Mean of log Data	-4.369	
Median	0.0073		SD of log Data	1.051	
SD	0.0826				

Coefficient of Variation		2.671		
Skewness		7.081		
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Lilliefors Test Statistic	0.382	Lilliefors Test Statistic	0.383	
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688	
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0415	95% H-UCL	0.0263	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0314	
95% Adjusted-CLT UCL	0.0452	97.5% Chebyshev (MVUE) UCL	0.0356	
95% Modified-t UCL	0.0421	99% Chebyshev (MVUE) UCL	0.0437	
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.672	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.046			
nu star	223.1			
Approximate Chi Square Value (.05)	189.5	Nonparametric Statistics		
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0414	
Adjusted Chi Square Value	189.2	95% Jackknife UCL	0.0415	
		95% Standard Bootstrap UCL	0.0416	
Anderson-Darling Test Statistic	29.15	95% Bootstrap-t UCL	0.0517	
Anderson-Darling 5% Critical Value	0.803	95% Hall's Bootstrap UCL	0.0884	
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	0.0425	
Kolmogorov-Smirnov 5% Critical Value	0.0757	95% BCA Bootstrap UCL	0.0466	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0588	
		97.5% Chebyshev(Mean, Sd) UCL	0.0709	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0947	
95% Approximate Gamma UCL	0.0364			
95% Adjusted Gamma UCL	0.0364			
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0709	
Result or 1/2 SDL (dieltrin)				
General Statistics				
Number of Valid Samples	166	Number of Unique Samples	96	
Raw Statistics		Log-transformed Statistics		
Minimum	7.0000E-5	Minimum of Log Data	-9.567	
Maximum	0.0205	Maximum of Log Data	-3.887	
Mean	9.0075E-4	Mean of log Data	-8.536	
Median	8.5500E-5	SD of log Data	1.433	
SD	0.0025			
Coefficient of Variation	2.865			
Skewness	5.111			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		

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95% Student's-t UCL		0.0492	95% H-UCL		0.0352
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0409
95% Adjusted-CLT UCL		0.0521	97.5% Chebyshev (MVUE) UCL		0.0453
95% Modified-t UCL		0.0497	99% Chebyshev (MVUE) UCL		0.054
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.941	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0416			
nu star		312.3			
Approximate Chi Square Value (.05)		272.4	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		0.0491
Adjusted Chi Square Value		272.1	95% Jackknife UCL		0.0492
			95% Standard Bootstrap UCL		0.0492
Anderson-Darling Test Statistic		34.67	95% Bootstrap-t UCL		0.0549
Anderson-Darling 5% Critical Value		0.786	95% Hall's Bootstrap UCL		0.0617
Kolmogorov-Smirnov Test Statistic		0.428	95% Percentile Bootstrap UCL		0.0497
Kolmogorov-Smirnov 5% Critical Value		0.0747	95% BCA Bootstrap UCL		0.0524
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0657
			97.5% Chebyshev(Mean, Sd) UCL		0.0772
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0998
95% Approximate Gamma UCL		0.0448			
95% Adjusted Gamma UCL		0.0449			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		0.0657
Result or 1/2 SDL (endosulfan sulfate)					
General Statistics					
Number of Valid Samples		166	Number of Unique Samples		105
Raw Statistics			Log-transformed Statistics		
Minimum		1.3250E-4	Minimum of Log Data		-8.929
Maximum		0.0713	Maximum of Log Data		-2.641
Mean		0.0013	Mean of log Data		-8.164
Median		1.5825E-4	SD of log Data		1.216
SD		0.0061			
Coefficient of Variation		4.659			
Skewness		9.667			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.423	Lilliefors Test Statistic		0.372
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0021	95% H-UCL		7.4558E-4
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		9.0731E-4
95% Adjusted-CLT UCL		0.0024	97.5% Chebyshev (MVUE) UCL		0.0010
95% Modified-t UCL		0.0021	99% Chebyshev (MVUE) UCL		0.0013

Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.422		Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0031				
nu star	140				
Approximate Chi Square Value (.05)	113.7		Nonparametric Statistics		
Adjusted Level of Significance	0.0486		95% CLT UCL	0.0021	
Adjusted Chi Square Value	113.5		95% Jackknife UCL	0.0021	
			95% Standard Bootstrap UCL	0.0021	
Anderson-Darling Test Statistic	34.91		95% Bootstrap-t UCL	0.0036	
Anderson-Darling 5% Critical Value	0.838		95% Hall's Bootstrap UCL	0.0048	
Kolmogorov-Smirnov Test Statistic	0.398		95% Percentile Bootstrap UCL	0.0021	
Kolmogorov-Smirnov 5% Critical Value	0.0774		95% BCA Bootstrap UCL	0.0026	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0033	
			97.5% Chebyshev(Mean, Sd) UCL	0.0042	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0060	
95% Approximate Gamma UCL	0.0016				
95% Adjusted Gamma UCL	0.0016				
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL	0.0042	

Result or 1/2 SDL (endrin aldehyde)

General Statistics				
Number of Valid Samples	166	Number of Unique Samples	117	
Raw Statistics		Log-transformed Statistics		
Minimum	1.6800E-4	Minimum of Log Data	-8.692	
Maximum	0.0738	Maximum of Log Data	-2.606	
Mean	0.0019	Mean of log Data	-7.839	
Median	2.0050E-4	SD of log Data	1.344	
SD	0.0073			
Coefficient of Variation	3.692			
Skewness	7.123			

Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Lilliefors Test Statistic	0.402	Lilliefors Test Statistic	0.383	
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688	
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0029	95% H-UCL	0.0012	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015	
95% Adjusted-CLT UCL	0.0032	97.5% Chebyshev (MVUE) UCL	0.0018	
95% Modified-t UCL	0.0029	99% Chebyshev (MVUE) UCL	0.0023	

Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.402		Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0049				
nu star	133.4				
Approximate Chi Square Value (.05)	107.7		Nonparametric Statistics		

Adjusted Level of Significance	0.0486	95% CLT UCL	0.0029
Adjusted Chi Square Value	107.5	95% Jackknife UCL	0.0029
		95% Standard Bootstrap UCL	0.0029
Anderson-Darling Test Statistic	33.76	95% Bootstrap-t UCL	0.0036
Anderson-Darling 5% Critical Value	0.843	95% Hall's Bootstrap UCL	0.0062
Kolmogorov-Smirnov Test Statistic	0.409	95% Percentile Bootstrap UCL	0.003
Kolmogorov-Smirnov 5% Critical Value	0.0776	95% BCA Bootstrap UCL	0.0032
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0044
		97.5% Chebyshev(Mean, Sd) UCL	0.0055
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0076
95% Approximate Gamma UCL	0.0024		
95% Adjusted Gamma UCL	0.0024		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0055
Result or 1/2 SDL (endrin ketone)			
General Statistics			
Number of Valid Samples	166	Number of Unique Samples	121
Raw Statistics		Log-transformed Statistics	
Minimum	2.1300E-4	Minimum of Log Data	-8.454
Maximum	0.0241	Maximum of Log Data	-3.726
Mean	0.0013	Mean of log Data	-7.664
Median	2.5250E-4	SD of log Data	1.185
SD	0.0032		
Coefficient of Variation	2.337		
Skewness	4.403		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.362	Lilliefors Test Statistic	0.376
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0017	95% H-UCL	0.0011
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0014
95% Adjusted-CLT UCL	0.0018	97.5% Chebyshev (MVUE) UCL	0.0016
95% Modified-t UCL	0.0018	99% Chebyshev (MVUE) UCL	0.0020
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.571	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0024		
nu star	189.7		
Approximate Chi Square Value (.05)	158.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0017
Adjusted Chi Square Value	158.6	95% Jackknife UCL	0.0017
		95% Standard Bootstrap UCL	0.0017
Anderson-Darling Test Statistic	30.37	95% Bootstrap-t UCL	0.0019
Anderson-Darling 5% Critical Value	0.813	95% Hall's Bootstrap UCL	0.0019

Kolmogorov-Smirnov Test Statistic	0.398	95% Percentile Bootstrap UCL	0.0017
Kolmogorov-Smirnov 5% Critical Value	0.0762	95% BCA Bootstrap UCL	0.0018
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0024
		97.5% Chebyshev(Mean, Sd) UCL	0.0029
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0038
95% Approximate Gamma UCL	0.0016		
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0029

Result or 1/2 SDL (ethylbenzene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	74
Raw Statistics		Log-transformed Statistics	
Minimum	7.7000E-5	Minimum of Log Data	-9.472
Maximum	0.105	Maximum of Log Data	-2.254
Mean	0.0038	Mean of log Data	-7.113
Median	0.0016	SD of log Data	1.759
SD	0.0129		
Coefficient of Variation	3.35		
Skewness	6.622		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.392	Lilliefors Test Statistic	0.2
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0062	95% H-UCL	0.0069
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0081
95% Adjusted-CLT UCL	0.0072	97.5% Chebyshev (MVUE) UCL	0.0101
95% Modified-t UCL	0.0063	99% Chebyshev (MVUE) UCL	0.014
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.413	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0093		
nu star	68.55		
Approximate Chi Square Value (.05)	50.49	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0061
Adjusted Chi Square Value	50.22	95% Jackknife UCL	0.0062
		95% Standard Bootstrap UCL	0.0061
Anderson-Darling Test Statistic	5.613	95% Bootstrap-t UCL	0.0094
Anderson-Darling 5% Critical Value	0.838	95% Hall's Bootstrap UCL	0.0082
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	0.0064
Kolmogorov-Smirnov 5% Critical Value	0.105	95% BCA Bootstrap UCL	0.0074
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.01
		97.5% Chebyshev(Mean, Sd) UCL	0.0127
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0179

95% Approximate Gamma UCL		0.0052			
95% Adjusted Gamma UCL		0.0052			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.0127
Result or 1/2 SDL (fluoranthene)					
General Statistics					
Number of Valid Samples		166	Number of Unique Samples		131
Raw Statistics			Log-transformed Statistics		
Minimum		0.0053	Minimum of Log Data		-5.231
Maximum		14.2	Maximum of Log Data		2.653
Mean		0.594	Mean of log Data		-2.889
Median		0.0409	SD of log Data		2.179
SD		1.674			
Coefficient of Variation		2.82			
Skewness		5.022			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.363	Lilliefors Test Statistic		0.148
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.809	95% H-UCL		1.062
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		1.289
95% Adjusted-CLT UCL		0.861	97.5% Chebyshev (MVUE) UCL		1.6
95% Modified-t UCL		0.817	99% Chebyshev (MVUE) UCL		2.21
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.291	Data do not follow a Discernable Distribution (0.05)		
Theta Star		2.039			
nu star		96.67			
Approximate Chi Square Value (.05)		74.99	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		0.807
Adjusted Chi Square Value		74.82	95% Jackknife UCL		0.809
			95% Standard Bootstrap UCL		0.811
Anderson-Darling Test Statistic		13.04	95% Bootstrap-t UCL		0.906
Anderson-Darling 5% Critical Value		0.872	95% Hall's Bootstrap UCL		0.935
Kolmogorov-Smirnov Test Statistic		0.211	95% Percentile Bootstrap UCL		0.823
Kolmogorov-Smirnov 5% Critical Value		0.0788	95% BCA Bootstrap UCL		0.89
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		1.16
			97.5% Chebyshev(Mean, Sd) UCL		1.405
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1.886
95% Approximate Gamma UCL		0.765			
95% Adjusted Gamma UCL		0.767			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		1.886

Result or 1/2 SDL (fluorene)

General Statistics			
Number of Valid Samples		166	
Number of Unique Samples		120	
Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.449
Maximum	1.11	Maximum of Log Data	0.104
Mean	0.0442	Mean of log Data	-4.461
Median	0.0051	SD of log Data	1.337
SD	0.129		
Coefficient of Variation	2.919		
Skewness	5.759		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.379	Lilliefors Test Statistic	0.34
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0607	95% H-UCL	0.0365
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0449
95% Adjusted-CLT UCL	0.0654	97.5% Chebyshev (MVUE) UCL	0.0523
95% Modified-t UCL	0.0615	99% Chebyshev (MVUE) UCL	0.0667
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.472	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0935		
nu star	156.9		
Approximate Chi Square Value (.05)	128.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0606
Adjusted Chi Square Value	128.7	95% Jackknife UCL	0.0607
		95% Standard Bootstrap UCL	0.0605
Anderson-Darling Test Statistic	25.32	95% Bootstrap-t UCL	0.069
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.0687
Kolmogorov-Smirnov Test Statistic	0.349	95% Percentile Bootstrap UCL	0.0617
Kolmogorov-Smirnov 5% Critical Value	0.0768	95% BCA Bootstrap UCL	0.065
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0878
		97.5% Chebyshev(Mean, Sd) UCL	0.107
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.144
95% Approximate Gamma UCL	0.0538		
95% Adjusted Gamma UCL	0.0539		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.107

Result or 1/2 SDL (gamma-chlordane)

General Statistics			
Number of Valid Samples		166	
Number of Unique Samples		95	

Raw Statistics			Log-transformed Statistics				
	Minimum	1.1000E-4		Minimum of Log Data	-9.115		
	Maximum	0.0156		Maximum of Log Data	-4.16		
	Mean	6.9043E-4		Mean of log Data	-8.462		
	Median	1.3050E-4		SD of log Data	1.117		
	SD	0.0020					
	Coefficient of Variation	3.004					
	Skewness	5.46					
Relevant UCL Statistics							
Normal Distribution Test			Lognormal Distribution Test				
	Lilliefors Test Statistic	0.403		Lilliefors Test Statistic	0.401		
	Lilliefors Critical Value	0.0688		Lilliefors Critical Value	0.0688		
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution			Assuming Lognormal Distribution				
	95% Student's-t UCL	9.5669E-4		95% H-UCL	4.8009E-4		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	5.7780E-4		
	95% Adjusted-CLT UCL	0.0010		97.5% Chebyshev (MVUE) UCL	6.5819E-4		
	95% Modified-t UCL	9.6806E-4		99% Chebyshev (MVUE) UCL	8.1611E-4		
Gamma Distribution Test			Data Distribution				
	k star (bias corrected)	0.526	Data do not follow a Discernable Distribution (0.05)				
	Theta Star	0.0013					
	nu star	174.6					
	Approximate Chi Square Value (.05)	145	Nonparametric Statistics				
	Adjusted Level of Significance	0.0486		95% CLT UCL	9.5520E-4		
	Adjusted Chi Square Value	144.8		95% Jackknife UCL	9.5669E-4		
				95% Standard Bootstrap UCL	9.5122E-4		
	Anderson-Darling Test Statistic	37.97		95% Bootstrap-t UCL	0.0011		
	Anderson-Darling 5% Critical Value	0.817		95% Hall's Bootstrap UCL	0.0010		
	Kolmogorov-Smirnov Test Statistic	0.436		95% Percentile Bootstrap UCL	9.6795E-4		
	Kolmogorov-Smirnov 5% Critical Value	0.0764		95% BCA Bootstrap UCL	0.0010		
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0013		
				97.5% Chebyshev(Mean, Sd) UCL	0.0017		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.0022		
	95% Approximate Gamma UCL	8.3116E-4					
	95% Adjusted Gamma UCL	8.3251E-4					
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL	0.0017		
Result or 1/2 SDL (heptachlorobiphenyl (170))							
General Statistics							
	Number of Valid Samples	27		Number of Unique Samples	18		
Raw Statistics			Log-transformed Statistics				
	Minimum	5.4000E-5		Minimum of Log Data	-9.827		
	Maximum	0.0112		Maximum of Log Data	-4.492		
	Mean	5.0765E-4		Mean of log Data	-9.29		

Median	6.0500E-5	SD of log Data	1.109
SD	0.0021		
Coefficient of Variation	4.214		
Skewness	5.179		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.22	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0012	95% H-UCL	3.0157E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.4359E-4
95% Adjusted-CLT UCL	0.0016	97.5% Chebyshev (MVUE) UCL	4.2093E-4
95% Modified-t UCL	0.0012	99% Chebyshev (MVUE) UCL	5.7284E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.37	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
nu star	19.96		
Approximate Chi Square Value (.05)	10.82	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0011
Adjusted Chi Square Value	10.39	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0011
Anderson-Darling Test Statistic	7.791	95% Bootstrap-t UCL	0.0215
Anderson-Darling 5% Critical Value	0.833	95% Hall's Bootstrap UCL	0.0127
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0023
		97.5% Chebyshev(Mean, Sd) UCL	0.0030
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0046
95% Approximate Gamma UCL	9.3640E-4		
95% Adjusted Gamma UCL	9.7515E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0046

Result or 1/2 SDL (heptachlorobiphenyl (180))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	21
Raw Statistics		Log-transformed Statistics	
Minimum	5.7500E-5	Minimum of Log Data	-9.764
Maximum	0.0183	Maximum of Log Data	-4.001
Mean	8.0478E-4	Mean of log Data	-9.025
Median	6.6000E-5	SD of log Data	1.215
SD	0.0035		
Coefficient of Variation	4.347		
Skewness	5.186		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.219	Shapiro Wilk Test Statistic	0.6
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0019	95% H-UCL	4.8616E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.3266E-4
95% Adjusted-CLT UCL	0.0026	97.5% Chebyshev (MVUE) UCL	6.5892E-4
95% Modified-t UCL	0.0020	99% Chebyshev (MVUE) UCL	9.0693E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.339	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0023		
nu star	18.3		
Approximate Chi Square Value (.05)	9.605	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0019
Adjusted Chi Square Value	9.203	95% Jackknife UCL	0.0019
Anderson-Darling Test Statistic	6.864	95% Standard Bootstrap UCL	0.0018
Anderson-Darling 5% Critical Value	0.841	95% Bootstrap-t UCL	0.0297
Kolmogorov-Smirnov Test Statistic	0.394	95% Hall's Bootstrap UCL	0.0148
Kolmogorov-Smirnov 5% Critical Value	0.181	95% Percentile Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% BCA Bootstrap UCL	0.0028
		95% Chebyshev(Mean, Sd) UCL	0.0037
Assuming Gamma Distribution		97.5% Chebyshev(Mean, Sd) UCL	0.0050
95% Approximate Gamma UCL	0.0015	99% Chebyshev(Mean, Sd) UCL	0.0075
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0075

Result or 1/2 SDL (heptachlorobiphenyl (183))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	6.6000E-5	Minimum of Log Data	-9.626
Maximum	0.0058	Maximum of Log Data	-5.148
Mean	3.0648E-4	Mean of log Data	-9.286
Median	7.3500E-5	SD of log Data	0.928
SD	0.0011		
Coefficient of Variation	3.607		
Skewness	5.118		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.228	Shapiro Wilk Test Statistic	0.339
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		6.6932E-4		95% H-UCL		2.2061E-4	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		2.6206E-4	
95% Adjusted-CLT UCL		8.8028E-4		97.5% Chebyshev (MVUE) UCL		3.1504E-4	
95% Modified-t UCL		7.0424E-4		99% Chebyshev (MVUE) UCL		4.1912E-4	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.493		Data do not follow a Discernable Distribution (0.05)			
Theta Star		6.2145E-4					
nu star		26.63					
Approximate Chi Square Value (.05)		15.87		Nonparametric Statistics			
Adjusted Level of Significance		0.0401		95% CLT UCL		6.5639E-4	
Adjusted Chi Square Value		15.33		95% Jackknife UCL		6.6932E-4	
				95% Standard Bootstrap UCL		6.4808E-4	
Anderson-Darling Test Statistic		9.122		95% Bootstrap-t UCL		0.0818	
Anderson-Darling 5% Critical Value		0.805		95% Hall's Bootstrap UCL		0.0174	
Kolmogorov-Smirnov Test Statistic		0.544		95% Percentile Bootstrap UCL		7.3128E-4	
Kolmogorov-Smirnov 5% Critical Value		0.178		95% BCA Bootstrap UCL		9.6457E-4	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0012	
				97.5% Chebyshev(Mean, Sd) UCL		0.0016	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0024	
95% Approximate Gamma UCL		5.1442E-4					
95% Adjusted Gamma UCL		5.3225E-4					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.0012	

Result or 1/2 SDL (heptachlorobiphenyl (187))

General Statistics			
Number of Valid Samples		27	Number of Unique Samples
			19
Raw Statistics		Log-transformed Statistics	
Minimum	5.1000E-5	Minimum of Log Data	-9.884
Maximum	0.0134	Maximum of Log Data	-4.313
Mean	5.9919E-4	Mean of log Data	-9.225
Median	5.8000E-5	SD of log Data	1.173
SD	0.0025		
Coefficient of Variation	4.273		
Skewness	5.183		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.221	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0014	95% H-UCL	3.6512E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.0685E-4
95% Adjusted-CLT UCL	0.0019	97.5% Chebyshev (MVUE) UCL	5.0141E-4

95% Modified-t UCL	0.0015	99% Chebyshev (MVUE) UCL	6.8716E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.353	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	19.06		
Approximate Chi Square Value (.05)	10.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0014
Adjusted Chi Square Value	9.748	95% Jackknife UCL	0.0014
		95% Standard Bootstrap UCL	0.0013
Anderson-Darling Test Statistic	7.089	95% Bootstrap-t UCL	0.0208
Anderson-Darling 5% Critical Value	0.837	95% Hall's Bootstrap UCL	0.0119
Kolmogorov-Smirnov Test Statistic	0.368	95% Percentile Bootstrap UCL	0.0015
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0027
		97.5% Chebyshev(Mean, Sd) UCL	0.0036
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0055
95% Approximate Gamma UCL	0.0011		
95% Adjusted Gamma UCL	0.0011		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0055

Result or 1/2 SDL (hexachlorobiphenyl (128))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	21
Raw Statistics		Log-transformed Statistics	
Minimum	8.5500E-5	Minimum of Log Data	-9.367
Maximum	0.0083	Maximum of Log Data	-4.784
Mean	4.5378E-4	Mean of log Data	-8.867
Median	9.6000E-5	SD of log Data	0.978
SD	0.0015		
Coefficient of Variation	3.498		
Skewness	5.123		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.243	Shapiro Wilk Test Statistic	0.519
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.7482E-4	95% H-UCL	3.6365E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.2833E-4
95% Adjusted-CLT UCL	0.0012	97.5% Chebyshev (MVUE) UCL	5.1775E-4
95% Modified-t UCL	0.0010	99% Chebyshev (MVUE) UCL	6.9340E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.502	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.0347E-4		

[illegible]

General Statistics

27

25

Raw Statistics

Minimum 1.2950E-4

Maximum 0.0432

Mean	0.0019
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Median 1.4700E-4

SD 0.0082

Coefficient of Variation	4.258
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Relevant UCL Statistics

Shapiro Wilk Test Statistic 0,226

Shapiro Wilk Test Statistic 0.632

Shapiro Wilk Critical Value 0.923

Data not Normal at 5% Significance Level

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 0.0046

95% UCLs (Adjusted for Skewness)

95% Chebyshev (MVUE) UCL 0.0014

95% Adjusted-CLT UCL 0.0062

95% Modified-t UCL 0.0049

Gamma Distribution Test

k star (bias corrected) 0.337

Theta Star	0.0057
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Nonparametric Statistics

95% CLT UCL 0.0045

Adjusted Level of Significance 0.0401

95% Jackknife UCL	0.0046
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Adjusted Chi Square Value 9.146

95% Standard Bootstrap UCL 0.0044

Anderson-Darling Test Statistic	6.365	95% Bootstrap-t UCL	0.0502
Anderson-Darling 5% Critical Value	0.841	95% Hall's Bootstrap UCL	0.0307
Kolmogorov-Smirnov Test Statistic	0.346	95% Percentile Bootstrap UCL	0.0051
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0067
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0088
		97.5% Chebyshev(Mean, Sd) UCL	0.0119
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0177
95% Approximate Gamma UCL	0.0037		
95% Adjusted Gamma UCL	0.0038		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0177

Result or 1/2 SDL (hexachlorobiphenyl (153))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	20
Raw Statistics		Log-transformed Statistics	
Minimum	6.2500E-5	Minimum of Log Data	-9.68
Maximum	0.0501	Maximum of Log Data	-2.994
Mean	0.0026	Mean of log Data	-8.616
Median	7.0500E-5	SD of log Data	1.726
SD	0.0099		
Coefficient of Variation	3.801		
Skewness	4.646		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.287	Shapiro Wilk Test Statistic	0.653
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0058	95% H-UCL	0.0026
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0020
95% Adjusted-CLT UCL	0.0075	97.5% Chebyshev (MVUE) UCL	0.0026
95% Modified-t UCL	0.0061	99% Chebyshev (MVUE) UCL	0.0037
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.259	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.01		
nu star	14.01		
Approximate Chi Square Value (.05)	6.579	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0057
Adjusted Chi Square Value	6.254	95% Jackknife UCL	0.0058
		95% Standard Bootstrap UCL	0.0056
Anderson-Darling Test Statistic	6.082	95% Bootstrap-t UCL	0.0897
Anderson-Darling 5% Critical Value	0.868	95% Hall's Bootstrap UCL	0.0577
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	0.0063
Kolmogorov-Smirnov 5% Critical Value	0.184	95% BCA Bootstrap UCL	0.0093
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0109

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL		0.0013
Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)				
General Statistics				
Number of Valid Samples		166	Number of Unique Samples	
			136	
Raw Statistics		Log-transformed Statistics		
	Minimum	0.0071	Minimum of Log Data	-4.948
	Maximum	6.49	Maximum of Log Data	1.87
	Mean	0.368	Mean of log Data	-2.635
	Median	0.0845	SD of log Data	1.884
	SD	0.812		
	Coefficient of Variation	2.21		
	Skewness	4.251		
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
	Lilliefors Test Statistic	0.335	Lilliefors Test Statistic	0.202
	Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
	95% Student's-t UCL	0.472	95% H-UCL	0.661
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.824
	95% Adjusted-CLT UCL	0.494	97.5% Chebyshev (MVUE) UCL	1.003
	95% Modified-t UCL	0.475	99% Chebyshev (MVUE) UCL	1.355
Gamma Distribution Test		Data Distribution		
	k star (bias corrected)	0.399	Data do not follow a Discernable Distribution (0.05)	
	Theta Star	0.921		
	nu star	132.4		
	Approximate Chi Square Value (.05)	106.9	Nonparametric Statistics	
	Adjusted Level of Significance	0.0486	95% CLT UCL	0.471
	Adjusted Chi Square Value	106.7	95% Jackknife UCL	0.472
			95% Standard Bootstrap UCL	0.474
	Anderson-Darling Test Statistic	9.141	95% Bootstrap-t UCL	0.514
	Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.526
	Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	0.476
	Kolmogorov-Smirnov 5% Critical Value	0.0776	95% BCA Bootstrap UCL	0.493
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.642
			97.5% Chebyshev(Mean, Sd) UCL	0.761
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.995
	95% Approximate Gamma UCL	0.456		
	95% Adjusted Gamma UCL	0.456		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL		0.761
Result or 1/2 SDL (iron)				

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		125
Raw Statistics			Log-transformed Statistics		
Minimum		2410	Minimum of Log Data		7.787
Maximum		77100	Maximum of Log Data		11.25
Mean		14277	Mean of log Data		9.418
Median		12400	SD of log Data		0.533
SD		9389			
Coefficient of Variation		0.658			
Skewness		3.268			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.205	Lilliefors Test Statistic		0.0905
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		15482	95% H-UCL		15314
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		16907
95% Adjusted-CLT UCL		15673	97.5% Chebyshev (MVUE) UCL		18087
95% Modified-t UCL		15513	99% Chebyshev (MVUE) UCL		20403
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		3.478	Data do not follow a Discernable Distribution (0.05)		
Theta Star		4105			
nu star		1155			
Approximate Chi Square Value (.05)		1077	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		15475
Adjusted Chi Square Value		1076	95% Jackknife UCL		15482
			95% Standard Bootstrap UCL		15452
Anderson-Darling Test Statistic		3.183	95% Bootstrap-t UCL		15756
Anderson-Darling 5% Critical Value		0.758	95% Hall's Bootstrap UCL		15776
Kolmogorov-Smirnov Test Statistic		0.127	95% Percentile Bootstrap UCL		15528
Kolmogorov-Smirnov 5% Critical Value		0.0728	95% BCA Bootstrap UCL		15729
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		17453
			97.5% Chebyshev(Mean, Sd) UCL		18828
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		21528
95% Approximate Gamma UCL		15309			
95% Adjusted Gamma UCL		15319			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		17453

Result or 1/2 SDL (isopropylbenzene (cumene))

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		64
Raw Statistics			Log-transformed Statistics		
Minimum		3.5000E-5	Minimum of Log Data		-10.26

Maximum	64.9	Maximum of Log Data	4.173
Mean	0.831	Mean of log Data	-8.404
Median	7.2000E-5	SD of log Data	2.525
SD	7.13		
Coefficient of Variation	8.582		
Skewness	9.065		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.514	Lilliefors Test Statistic	0.367
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.133	95% H-UCL	0.0167
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0143
95% Adjusted-CLT UCL	2.95	97.5% Chebyshev (MVUE) UCL	0.0185
95% Modified-t UCL	2.263	99% Chebyshev (MVUE) UCL	0.0267
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.103	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.035		
nu star	17.17		
Approximate Chi Square Value (.05)	8.79	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	2.118
Adjusted Chi Square Value	8.684	95% Jackknife UCL	2.133
		95% Standard Bootstrap UCL	2.092
Anderson-Darling Test Statistic	26.04	95% Bootstrap-t UCL	375
Anderson-Darling 5% Critical Value	1.026	95% Hall's Bootstrap UCL	363.5
Kolmogorov-Smirnov Test Statistic	0.415	95% Percentile Bootstrap UCL	2.393
Kolmogorov-Smirnov 5% Critical Value	0.113	95% BCA Bootstrap UCL	3.957
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.242
		97.5% Chebyshev(Mean, Sd) UCL	5.719
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.618
95% Approximate Gamma UCL	1.622		
95% Adjusted Gamma UCL	1.642		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	8.618

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples	166	Number of Unique Samples	145
Raw Statistics		Log-transformed Statistics	
Minimum	2.48	Minimum of Log Data	0.908
Maximum	702	Maximum of Log Data	6.554
Mean	53.52	Mean of log Data	3.186
Median	17.1	SD of log Data	1.12
SD	104.2		
Coefficient of Variation	1.947		

Skewness				4.276			
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Lilliefors Test Statistic		0.312		Lilliefors Test Statistic		0.138	
Lilliefors Critical Value		0.0688		Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		66.9		95% H-UCL		55.13	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		66.37	
95% Adjusted-CLT UCL		69.69		97.5% Chebyshev (MVUE) UCL		75.62	
95% Modified-t UCL		67.35		99% Chebyshev (MVUE) UCL		93.79	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.744		Data do not follow a Discernable Distribution (0.05)			
Theta Star		71.97					
nu star		246.9					
Approximate Chi Square Value (.05)		211.5		Nonparametric Statistics			
Adjusted Level of Significance		0.0486		95% CLT UCL		66.82	
Adjusted Chi Square Value		211.2		95% Jackknife UCL		66.9	
				95% Standard Bootstrap UCL		66.45	
Anderson-Darling Test Statistic		10.55		95% Bootstrap-t UCL		72.98	
Anderson-Darling 5% Critical Value		0.796		95% Hall's Bootstrap UCL		69.81	
Kolmogorov-Smirnov Test Statistic		0.191		95% Percentile Bootstrap UCL		67.23	
Kolmogorov-Smirnov 5% Critical Value		0.0753		95% BCA Bootstrap UCL		70.24	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		88.78	
				97.5% Chebyshev(Mean, Sd) UCL		104	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		134	
95% Approximate Gamma UCL		62.47					
95% Adjusted Gamma UCL		62.56					
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL		104	

Result or 1/2 SDL (lithium)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		145
Raw Statistics			Log-transformed Statistics		
	Minimum	0.65		Minimum of Log Data	-0.431
	Maximum	28.6		Maximum of Log Data	3.353
	Mean	10.03		Mean of log Data	2.054
	Median	9.02		SD of log Data	0.791
	SD	6.299			
	Coefficient of Variation	0.628			
	Skewness	0.63			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.101		Lilliefors Test Statistic	0.092

Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		10.84	95% H-UCL		12.06
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		13.87
95% Adjusted-CLT UCL		10.86	97.5% Chebyshev (MVUE) UCL		15.27
95% Modified-t UCL		10.85	99% Chebyshev (MVUE) UCL		18.02
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		2.103	Data do not follow a Discernable Distribution (0.05)		
Theta Star		4.77			
nu star		698.3			
Approximate Chi Square Value (.05)		638	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		10.84
Adjusted Chi Square Value		637.5	95% Jackknife UCL		10.84
			95% Standard Bootstrap UCL		10.82
Anderson-Darling Test Statistic		1.059	95% Bootstrap-t UCL		10.91
Anderson-Darling 5% Critical Value		0.765	95% Hall's Bootstrap UCL		10.87
Kolmogorov-Smirnov Test Statistic		0.0795	95% Percentile Bootstrap UCL		10.86
Kolmogorov-Smirnov 5% Critical Value		0.0733	95% BCA Bootstrap UCL		10.85
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		12.17
			97.5% Chebyshev(Mean, Sd) UCL		13.09
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		14.9
95% Approximate Gamma UCL		10.98			
95% Adjusted Gamma UCL		10.99			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		12.17

Result or 1/2 SDL (m,p-xylene)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		81
Raw Statistics			Log-transformed Statistics		
Minimum		9.1000E-5	Minimum of Log Data		-9.305
Maximum		2.56	Maximum of Log Data		0.94
Mean		0.0347	Mean of log Data		-6.851
Median		0.0011	SD of log Data		1.646
SD		0.281			
Coefficient of Variation		8.104			
Skewness		9.073			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.485	Lilliefors Test Statistic		0.175
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.086	95% H-UCL		0.0069

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0083
95% Adjusted-CLT UCL	0.118	97.5% Chebyshev (MVUE) UCL		0.0103
95% Modified-t UCL	0.0911	99% Chebyshev (MVUE) UCL		0.0141
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.21	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.165			
nu star	34.84			
Approximate Chi Square Value (.05)	22.34	Nonparametric Statistics		
Adjusted Level of Significance	0.0471	95% CLT UCL		0.0854
Adjusted Chi Square Value	22.16	95% Jackknife UCL		0.086
		95% Standard Bootstrap UCL		0.0857
Anderson-Darling Test Statistic	18.54	95% Bootstrap-t UCL		2.137
Anderson-Darling 5% Critical Value	0.906	95% Hall's Bootstrap UCL		1.249
Kolmogorov-Smirnov Test Statistic	0.41	95% Percentile Bootstrap UCL		0.0961
Kolmogorov-Smirnov 5% Critical Value	0.108	95% BCA Bootstrap UCL		0.156
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.169
		97.5% Chebyshev(Mean, Sd) UCL		0.227
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.342
95% Approximate Gamma UCL	0.0541			
95% Adjusted Gamma UCL	0.0545			
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL		0.227

Result or 1/2 SDL (manganese)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	133
Raw Statistics		Log-transformed Statistics	
Minimum	59.3	Minimum of Log Data	4.083
Maximum	892	Maximum of Log Data	6.793
Mean	261.2	Mean of log Data	5.47
Median	224.5	SD of log Data	0.429
SD	127.4		
Coefficient of Variation	0.488		
Skewness	2.072		

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.146	Lilliefors Test Statistic		0.0718
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		277.5	95% H-UCL		276.1
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		299.4
95% Adjusted-CLT UCL		279.2	97.5% Chebyshev (MVUE) UCL		316.4
95% Modified-t UCL		277.8	99% Chebyshev (MVUE) UCL		349.9
Gamma Distribution Test			Data Distribution		

k star (bias corrected)	5.314	Data do not follow a Discernable Distribution (0.05)	
Theta Star	49.15		
nu star	1764		
Approximate Chi Square Value (.05)	1668	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	277.5
Adjusted Chi Square Value	1667	95% Jackknife UCL	277.5
		95% Standard Bootstrap UCL	277.3
Anderson-Darling Test Statistic	2.43	95% Bootstrap-t UCL	279
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	280.1
Kolmogorov-Smirnov Test Statistic	0.0858	95% Percentile Bootstrap UCL	278.6
Kolmogorov-Smirnov 5% Critical Value	0.0725	95% BCA Bootstrap UCL	278.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	304.3
		97.5% Chebyshev(Mean, Sd) UCL	323
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	359.6
95% Approximate Gamma UCL	276.3		
95% Adjusted Gamma UCL	276.4		
Potential UCL to Use		Use 95% Student's-t UCL	277.5
		or 95% Modified-t UCL	277.8

Result or 1/2 SDL (mercury)

General Statistics			
Number of Valid Samples	166	Number of Unique Samples	94
Raw Statistics		Log-transformed Statistics	
Minimum	0.001	Minimum of Log Data	-6.908
Maximum	0.85	Maximum of Log Data	-0.163
Mean	0.0262	Mean of log Data	-4.969
Median	0.0068	SD of log Data	1.332
SD	0.0941		
Coefficient of Variation	3.59		
Skewness	6.891		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.394	Lilliefors Test Statistic	0.0972
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0383	95% H-UCL	0.0218
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0268
95% Adjusted-CLT UCL	0.0424	97.5% Chebyshev (MVUE) UCL	0.0312
95% Modified-t UCL	0.0389	99% Chebyshev (MVUE) UCL	0.0398
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.477	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.055		
nu star	158.3		
Approximate Chi Square Value (.05)	130.2	Nonparametric Statistics	

Adjusted Level of Significance	0.0486	95% CLT UCL	0.0382
Adjusted Chi Square Value	130	95% Jackknife UCL	0.0383
		95% Standard Bootstrap UCL	0.0378
Anderson-Darling Test Statistic	14.93	95% Bootstrap-t UCL	0.0543
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.0842
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	0.0396
Kolmogorov-Smirnov 5% Critical Value	0.0768	95% BCA Bootstrap UCL	0.0435
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.058
		97.5% Chebyshev(Mean, Sd) UCL	0.0718
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0988
95% Approximate Gamma UCL	0.0319		
95% Adjusted Gamma UCL	0.0319		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0718

Result or 1/2 SDL (methylcyclohexane)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	77
Raw Statistics		Log-transformed Statistics	
Minimum	1.3750E-4	Minimum of Log Data	-8.892
Maximum	2.73	Maximum of Log Data	1.004
Mean	0.0369	Mean of log Data	-6.534
Median	0.0019	SD of log Data	1.611
SD	0.299		
Coefficient of Variation	8.123		
Skewness	9.089		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.494	Lilliefors Test Statistic	0.199
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0915	95% H-UCL	0.0088
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0108
95% Adjusted-CLT UCL	0.126	97.5% Chebyshev (MVUE) UCL	0.0132
95% Modified-t UCL	0.097	99% Chebyshev (MVUE) UCL	0.0179
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.224	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.165		
nu star	37.11		
Approximate Chi Square Value (.05)	24.17	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0909
Adjusted Chi Square Value	23.98	95% Jackknife UCL	0.0915
		95% Standard Bootstrap UCL	0.0909
Anderson-Darling Test Statistic	18.27	95% Bootstrap-t UCL	1.459
Anderson-Darling 5% Critical Value	0.9	95% Hall's Bootstrap UCL	1.338

Kolmogorov-Smirnov Test Statistic		0.431	95% Percentile Bootstrap UCL		0.102
Kolmogorov-Smirnov 5% Critical Value		0.108	95% BCA Bootstrap UCL		0.168
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.18
			97.5% Chebyshev(Mean, Sd) UCL		0.242
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.364
95% Approximate Gamma UCL		0.0566			
95% Adjusted Gamma UCL		0.057			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.242
Result or 1/2 SDL (molybdenum)					
General Statistics					
Number of Valid Samples		166	Number of Unique Samples		102
Raw Statistics			Log-transformed Statistics		
Minimum		0.034	Minimum of Log Data		-3.381
Maximum		10.4	Maximum of Log Data		2.342
Mean		0.89	Mean of log Data		-1.228
Median		0.305	SD of log Data		1.597
SD		1.488			
Coefficient of Variation		1.671			
Skewness		3.38			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.282	Lilliefors Test Statistic		0.164
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		1.081	95% H-UCL		1.474
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		1.842
95% Adjusted-CLT UCL		1.113	97.5% Chebyshev (MVUE) UCL		2.192
95% Modified-t UCL		1.086	99% Chebyshev (MVUE) UCL		2.881
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.555	Data do not follow a Discernable Distribution (0.05)		
Theta Star		1.604			
nu star		184.3			
Approximate Chi Square Value (.05)		153.9	Nonparametric Statistics		
Adjusted Level of Significance		0.0486	95% CLT UCL		1.08
Adjusted Chi Square Value		153.7	95% Jackknife UCL		1.081
			95% Standard Bootstrap UCL		1.082
Anderson-Darling Test Statistic		4.333	95% Bootstrap-t UCL		1.129
Anderson-Darling 5% Critical Value		0.814	95% Hall's Bootstrap UCL		1.133
Kolmogorov-Smirnov Test Statistic		0.131	95% Percentile Bootstrap UCL		1.094
Kolmogorov-Smirnov 5% Critical Value		0.0763	95% BCA Bootstrap UCL		1.13
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		1.394
			97.5% Chebyshev(Mean, Sd) UCL		1.611
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		2.039

95% Approximate Gamma UCL		1.066		
95% Adjusted Gamma UCL		1.068		
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL	1.611
Result or 1/2 SDL (naphthalene)				
General Statistics				
Number of Valid Samples		83	Number of Unique Samples	79
Raw Statistics			Log-transformed Statistics	
Minimum	1.3600E-4		Minimum of Log Data	-8.903
Maximum	19.2		Maximum of Log Data	2.955
Mean	0.323		Mean of log Data	-6.969
Median	0.0013		SD of log Data	2.216
SD	2.245			
Coefficient of Variation	6.94			
Skewness	7.803			
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Lilliefors Test Statistic	0.511		Lilliefors Test Statistic	0.208
Lilliefors Critical Value	0.0973		Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL	0.733		95% H-UCL	0.0266
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.0271
95% Adjusted-CLT UCL	0.954		97.5% Chebyshev (MVUE) UCL	0.0345
95% Modified-t UCL	0.768		99% Chebyshev (MVUE) UCL	0.049
Gamma Distribution Test			Data Distribution	
k star (bias corrected)	0.137		Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.362			
nu star	22.74			
Approximate Chi Square Value (.05)	12.89		Nonparametric Statistics	
Adjusted Level of Significance	0.0471		95% CLT UCL	0.729
Adjusted Chi Square Value	12.76		95% Jackknife UCL	0.733
			95% Standard Bootstrap UCL	0.735
Anderson-Darling Test Statistic	21.77		95% Bootstrap-t UCL	52.02
Anderson-Darling 5% Critical Value	0.973		95% Hall's Bootstrap UCL	53.32
Kolmogorov-Smirnov Test Statistic	0.411		95% Percentile Bootstrap UCL	0.785
Kolmogorov-Smirnov 5% Critical Value	0.111		95% BCA Bootstrap UCL	1.047
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	1.397
			97.5% Chebyshev(Mean, Sd) UCL	1.862
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	2.775
95% Approximate Gamma UCL	0.57			
95% Adjusted Gamma UCL	0.576			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	2.775

Result or 1/2 SDL (nickel)			
General Statistics			
Number of Valid Samples	166	Number of Unique Samples	120
Raw Statistics		Log-transformed Statistics	
Minimum	2.7	Minimum of Log Data	0.993
Maximum	36.7	Maximum of Log Data	3.603
Mean	11.74	Mean of log Data	2.374
Median	11.65	SD of log Data	0.441
SD	4.874		
Coefficient of Variation	0.415		
Skewness	1.176		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0957	Lilliefors Test Statistic	0.107
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.37	95% H-UCL	12.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.68
95% Adjusted-CLT UCL	12.4	97.5% Chebyshev (MVUE) UCL	14.47
95% Modified-t UCL	12.37	99% Chebyshev (MVUE) UCL	16.04
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.687	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.064		
nu star	1888		
Approximate Chi Square Value (.05)	1788	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	12.36
Adjusted Chi Square Value	1787	95% Jackknife UCL	12.37
		95% Standard Bootstrap UCL	12.37
Anderson-Darling Test Statistic	1.205	95% Bootstrap-t UCL	12.42
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	12.45
Kolmogorov-Smirnov Test Statistic	0.0793	95% Percentile Bootstrap UCL	12.38
Kolmogorov-Smirnov 5% Critical Value	0.0725	95% BCA Bootstrap UCL	12.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.39
		97.5% Chebyshev(Mean, Sd) UCL	14.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.5
95% Approximate Gamma UCL	12.4		
95% Adjusted Gamma UCL	12.4		
Potential UCL to Use		Use 95% Student's-t UCL	12.37
		or 95% Modified-t UCL	12.37

Result or 1/2 SDL (nonachlorobiphenyl (206))

General Statistics

Number of Valid Samples		27	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum	5.6500E-5		Minimum of Log Data	-9.781	
Maximum	0.0048		Maximum of Log Data	-5.335	
Mean	3.0406E-4		Mean of log Data	-9.327	
Median	6.3000E-5		SD of log Data	1.068	
SD	9.3907E-4				
Coefficient of Variation	3.088				
Skewness	4.659				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.294		Shapiro Wilk Test Statistic	0.423	
Shapiro Wilk Critical Value	0.923		Shapiro Wilk Critical Value	0.923	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	6.1230E-4		95% H-UCL	2.6973E-4	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	3.1099E-4	
95% Adjusted-CLT UCL	7.7447E-4		97.5% Chebyshev (MVUE) UCL	3.7949E-4	
95% Modified-t UCL	6.3931E-4		99% Chebyshev (MVUE) UCL	5.1405E-4	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.482		Data do not follow a Discernable Distribution (0.05)		
Theta Star	6.3045E-4				
nu star	26.04				
Approximate Chi Square Value (.05)	15.41		Nonparametric Statistics		
Adjusted Level of Significance	0.0401		95% CLT UCL	6.0132E-4	
Adjusted Chi Square Value	14.89		95% Jackknife UCL	6.1230E-4	
			95% Standard Bootstrap UCL	5.9026E-4	
Anderson-Darling Test Statistic	8.142		95% Bootstrap-t UCL	0.0025	
Anderson-Darling 5% Critical Value	0.806		95% Hall's Bootstrap UCL	0.0027	
Kolmogorov-Smirnov Test Statistic	0.527		95% Percentile Bootstrap UCL	6.4078E-4	
Kolmogorov-Smirnov 5% Critical Value	0.178		95% BCA Bootstrap UCL	9.0915E-4	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0010	
			97.5% Chebyshev(Mean, Sd) UCL	0.0014	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0021	
95% Approximate Gamma UCL	5.1377E-4				
95% Adjusted Gamma UCL	5.3182E-4				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	0.0021	

Result or 1/2 SDL (n-propylbenzene)

General Statistics					
Number of Valid Samples		83	Number of Unique Samples		57
Raw Statistics			Log-transformed Statistics		
Minimum	3.2000E-5		Minimum of Log Data	-10.35	
Maximum	1.8		Maximum of Log Data	0.588	

Mean	0.0237	Mean of log Data	-8.883
Median	6.6000E-5	SD of log Data	1.815
SD	0.198		
Coefficient of Variation	8.331		
Skewness	9.058		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.503	Lilliefors Test Statistic	0.353
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0598	95% H-UCL	0.0013
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0015
95% Adjusted-CLT UCL	0.0825	97.5% Chebyshev (MVUE) UCL	0.0019
95% Modified-t UCL	0.0634	99% Chebyshev (MVUE) UCL	0.0027
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.152	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.156		
nu star	25.26		
Approximate Chi Square Value (.05)	14.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0594
Adjusted Chi Square Value	14.67	95% Jackknife UCL	0.0598
		95% Standard Bootstrap UCL	0.0596
Anderson-Darling Test Statistic	25.64	95% Bootstrap-t UCL	1.155
Anderson-Darling 5% Critical Value	0.958	95% Hall's Bootstrap UCL	1.125
Kolmogorov-Smirnov Test Statistic	0.434	95% Percentile Bootstrap UCL	0.0671
Kolmogorov-Smirnov 5% Critical Value	0.111	95% BCA Bootstrap UCL	0.11
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.118
		97.5% Chebyshev(Mean, Sd) UCL	0.159
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.24
95% Approximate Gamma UCL	0.0405		
95% Adjusted Gamma UCL	0.0409		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.159

Result or 1/2 SDL (o-xylene)

General Statistics

Number of Valid Samples	83	Number of Unique Samples	71
Raw Statistics		Log-transformed Statistics	
Minimum	4.0000E-5	Minimum of Log Data	-10.13
Maximum	0.84	Maximum of Log Data	-0.174
Mean	0.0132	Mean of log Data	-8.136
Median	9.5000E-5	SD of log Data	1.904
SD	0.0931		
Coefficient of Variation	7.053		
Skewness	8.784		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.476	Lilliefors Test Statistic	0.243
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0302	95% H-UCL	0.0035
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0040
95% Adjusted-CLT UCL	0.0405	97.5% Chebyshev (MVUE) UCL	0.0050
95% Modified-t UCL	0.0318	99% Chebyshev (MVUE) UCL	0.0070
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.195	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0676		
nu star	32.4		
Approximate Chi Square Value (.05)	20.39	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.03
Adjusted Chi Square Value	20.22	95% Jackknife UCL	0.0302
		95% Standard Bootstrap UCL	0.03
Anderson-Darling Test Statistic	18.03	95% Bootstrap-t UCL	0.241
Anderson-Darling 5% Critical Value	0.916	95% Hall's Bootstrap UCL	0.239
Kolmogorov-Smirnov Test Statistic	0.354	95% Percentile Bootstrap UCL	0.0331
Kolmogorov-Smirnov 5% Critical Value	0.109	95% BCA Bootstrap UCL	0.0461
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0577
		97.5% Chebyshev(Mean, Sd) UCL	0.077
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.115
95% Approximate Gamma UCL	0.021		
95% Adjusted Gamma UCL	0.0211		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.077

Result or 1/2 SDL (pentachlorobiphenyl (101))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	22
Raw Statistics		Log-transformed Statistics	
Minimum	9.8500E-5	Minimum of Log Data	-9.225
Maximum	0.0445	Maximum of Log Data	-3.112
Mean	0.0024	Mean of log Data	-8.262
Median	1.0650E-4	SD of log Data	1.554
SD	0.0088		
Coefficient of Variation	3.661		
Skewness	4.618		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.292	Shapiro Wilk Test Statistic	0.664
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0052		95% H-UCL		0.0023	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			
95% Adjusted-CLT UCL		0.0068		97.5% Chebyshev (MVUE) UCL		0.0026	
95% Modified-t UCL		0.0055		99% Chebyshev (MVUE) UCL		0.0037	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.298		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0080					
nu star		16.11					
Approximate Chi Square Value (.05)		8.038		Nonparametric Statistics			
Adjusted Level of Significance		0.0401		95% CLT UCL		0.0051	
Adjusted Chi Square Value		7.674		95% Jackknife UCL		0.0052	
				95% Standard Bootstrap UCL		0.0051	
Anderson-Darling Test Statistic		5.88		95% Bootstrap-t UCL		0.0709	
Anderson-Darling 5% Critical Value		0.851		95% Hall's Bootstrap UCL		0.0384	
Kolmogorov-Smirnov Test Statistic		0.348		95% Percentile Bootstrap UCL		0.0054	
Kolmogorov-Smirnov 5% Critical Value		0.183		95% BCA Bootstrap UCL		0.0078	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0097	
				97.5% Chebyshev(Mean, Sd) UCL		0.013	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0193	
95% Approximate Gamma UCL		0.0048					
95% Adjusted Gamma UCL		0.0050					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.0193	

Result or 1/2 SDL (pentachlorobiphenyl (105))

General Statistics			
Number of Valid Samples		27	
Raw Statistics		Log-transformed Statistics	
Minimum		8.5500E-5	
Maximum		0.0149	
Mean		6.7935E-4	
Median		9.5000E-5	
SD		0.0028	
Coefficient of Variation		4.189	
Skewness		5.174	

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.217	
Shapiro Wilk Critical Value		0.923	
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		0.0016	
95% UCLs (Adjusted for Skewness)			
		95% H-UCL	3.8825E-4
		95% Chebyshev (MVUE) UCL	4.4827E-4

95% Adjusted-CLT UCL	0.0021	97.5% Chebyshev (MVUE) UCL	5.4673E-4
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	7.4014E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.378	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0018		
nu star	20.4		
Approximate Chi Square Value (.05)	11.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0015
Adjusted Chi Square Value	10.71	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0015
Anderson-Darling Test Statistic	8.853	95% Bootstrap-t UCL	0.0351
Anderson-Darling 5% Critical Value	0.831	95% Hall's Bootstrap UCL	0.0349
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	0.0017
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	0.0028
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0030
		97.5% Chebyshev(Mean, Sd) UCL	0.0041
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0061
95% Approximate Gamma UCL	0.0012		
95% Adjusted Gamma UCL	0.0012		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0061

Result or 1/2 SDL (pentachlorobiphenyl (118))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	24
Raw Statistics		Log-transformed Statistics	
Minimum	1.4100E-4	Minimum of Log Data	-8.867
Maximum	0.0363	Maximum of Log Data	-3.316
Mean	0.0016	Mean of log Data	-8.275
Median	1.5900E-4	SD of log Data	1.154
SD	0.0069		
Coefficient of Variation	4.326		
Skewness	5.184		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.218	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0038	95% H-UCL	9.1008E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0010
95% Adjusted-CLT UCL	0.0052	97.5% Chebyshev (MVUE) UCL	0.0012
95% Modified-t UCL	0.0041	99% Chebyshev (MVUE) UCL	0.0017
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.348	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0046		
nu star	18.77		
Approximate Chi Square Value (.05)	9.953	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0038
Adjusted Chi Square Value	9.542	95% Jackknife UCL	0.0038
		95% Standard Bootstrap UCL	0.0037
Anderson-Darling Test Statistic	7.604	95% Bootstrap-t UCL	0.0662
Anderson-Darling 5% Critical Value	0.839	95% Hall's Bootstrap UCL	0.0422
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	0.0042
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.0068
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0074
		97.5% Chebyshev(Mean, Sd) UCL	0.0099
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0149
95% Approximate Gamma UCL	0.0030		
95% Adjusted Gamma UCL	0.0031		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0149

Result or 1/2 SDL (pentachlorobiphenyl (87))

General Statistics			
Number of Valid Samples	27	Number of Unique Samples	23
Raw Statistics		Log-transformed Statistics	
Minimum	1.1750E-4	Minimum of Log Data	-9.049
Maximum	0.0257	Maximum of Log Data	-3.661
Mean	0.0014	Mean of log Data	-8.363
Median	1.3200E-4	SD of log Data	1.31
SD	0.0050		
Coefficient of Variation	3.554		
Skewness	4.689		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.287	Shapiro Wilk Test Statistic	0.547
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0030	95% H-UCL	0.0011
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0012
95% Adjusted-CLT UCL	0.0039	97.5% Chebyshev (MVUE) UCL	0.0015
95% Modified-t UCL	0.0032	99% Chebyshev (MVUE) UCL	0.0021
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.353	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0040		
nu star	19.06		
Approximate Chi Square Value (.05)	10.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0030
Adjusted Chi Square Value	9.747	95% Jackknife UCL	0.0030

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General Statistics

Raw Statistics		Log-transformed Statistics	
Minimum	0.0057	Minimum of Log Data	-5.159
Maximum	12.6	Maximum of Log Data	2.534
Mean	0.401	Mean of log Data	-3.001
Median	0.0421	SD of log Data	2.017
SD	1.228		
Coefficient of Variation	3.064		
Skewness	6.986		

Normal Distribution Test

Lilliefors Test Statistic	0.374	Lilliefors Test Statistic	0.185
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688

Assuming Normal Distribution

95% Student's-t UCL	0.559	95% H-UCL	0.628
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.776
95% Adjusted-CLT UCL	0.613	97.5% Chebyshev (MVUE) UCL	0.954
95% Modified-t UCL	0.567	99% Chebyshev (MVUE) UCL	1.302

Data Distribution

Theta Star	1.237
nu star	107.6

Nonparametric Statistics

Adjusted Chi Square Value	84.47	95% Jackknife UCL	0.559
		95% Standard Bootstrap UCL	0.56
Anderson-Darling Test Statistic	12.32	95% Bootstrap-t UCL	0.677
Anderson-Darling 5% Critical Value	0.862	95% Hall's Bootstrap UCL	1.18
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	0.578
Kolmogorov-Smirnov 5% Critical Value	0.0784	95% BCA Bootstrap UCL	0.651

Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.816
				97.5% Chebyshev(Mean, Sd) UCL		0.996
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		1.349
95% Approximate Gamma UCL		0.51				
95% Adjusted Gamma UCL		0.511				
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		1.349
Result or 1/2 SDL (pyrene)						
General Statistics						
Number of Valid Samples		166	Number of Unique Samples		134	
Raw Statistics			Log-transformed Statistics			
Minimum		0.0055	Minimum of Log Data		-5.194	
Maximum		8.47	Maximum of Log Data		2.137	
Mean		0.432	Mean of log Data		-2.891	
Median		0.0414	SD of log Data		2.024	
SD		1.11				
Coefficient of Variation		2.57				
Skewness		4.384				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Lilliefors Test Statistic		0.35	Lilliefors Test Statistic		0.128	
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.575	95% H-UCL		0.714	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.882	
95% Adjusted-CLT UCL		0.605	97.5% Chebyshev (MVUE) UCL		1.084	
95% Modified-t UCL		0.58	99% Chebyshev (MVUE) UCL		1.481	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.329	Data do not follow a Discernable Distribution (0.05)			
Theta Star		1.314				
nu star		109.2				
Approximate Chi Square Value (.05)		86.04	Nonparametric Statistics			
Adjusted Level of Significance		0.0486	95% CLT UCL		0.574	
Adjusted Chi Square Value		85.87	95% Jackknife UCL		0.575	
			95% Standard Bootstrap UCL		0.576	
Anderson-Darling Test Statistic		11.49	95% Bootstrap-t UCL		0.618	
Anderson-Darling 5% Critical Value		0.861	95% Hall's Bootstrap UCL		0.616	
Kolmogorov-Smirnov Test Statistic		0.186	95% Percentile Bootstrap UCL		0.575	
Kolmogorov-Smirnov 5% Critical Value		0.0783	95% BCA Bootstrap UCL		0.613	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.808	
			97.5% Chebyshev(Mean, Sd) UCL		0.97	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1.29	
95% Approximate Gamma UCL		0.548				
95% Adjusted Gamma UCL		0.549				

Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL				1.29
Result or 1/2 SDL (selenium)								
General Statistics								
Number of Valid Samples			166	Number of Unique Samples			32	
Raw Statistics				Log-transformed Statistics				
Minimum		0.21	Minimum of Log Data		-1.561			
Maximum		1.13	Maximum of Log Data		0.122			
Mean		0.28	Mean of log Data		-1.319			
Median		0.25	SD of log Data		0.267			
SD		0.119						
Coefficient of Variation		0.426						
Skewness		4.859						
Relevant UCL Statistics								
Normal Distribution Test				Lognormal Distribution Test				
Lilliefors Test Statistic		0.378	Lilliefors Test Statistic		0.329			
Lilliefors Critical Value		0.0688	Lilliefors Critical Value		0.0688			
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL		0.296	95% H-UCL		0.287			
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.302		
95% Adjusted-CLT UCL		0.299	97.5% Chebyshev (MVUE) UCL		0.313			
95% Modified-t UCL		0.296	99% Chebyshev (MVUE) UCL		0.335			
Gamma Distribution Test				Data Distribution				
k star (bias corrected)		10.6	Data do not follow a Discernable Distribution (0.05)					
Theta Star		0.0265						
nu star		3518						
Approximate Chi Square Value (.05)		3381	Nonparametric Statistics					
Adjusted Level of Significance		0.0486	95% CLT UCL		0.296			
Adjusted Chi Square Value		3380	95% Jackknife UCL		0.296			
			95% Standard Bootstrap UCL		0.296			
Anderson-Darling Test Statistic		26.48	95% Bootstrap-t UCL		0.302			
Anderson-Darling 5% Critical Value		0.751	95% Hall's Bootstrap UCL		0.304			
Kolmogorov-Smirnov Test Statistic		0.351	95% Percentile Bootstrap UCL		0.297			
Kolmogorov-Smirnov 5% Critical Value		0.0723	95% BCA Bootstrap UCL		0.3			
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.321		
				97.5% Chebyshev(Mean, Sd) UCL		0.338		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.372		
95% Approximate Gamma UCL		0.292						
95% Adjusted Gamma UCL		0.292						
Potential UCL to Use				Use 95% Student's-t UCL		0.296		
				or 95% Modified-t UCL		0.296		

Result or 1/2 SDL (silver)

General Statistics			
Number of Valid Samples		166	
Number of Unique Samples			40
Raw Statistics		Log-transformed Statistics	
Minimum	0.0235	Minimum of Log Data	-3.751
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.063	Mean of log Data	-3.356
Median	0.028	SD of log Data	0.716
SD	0.165		
Coefficient of Variation	2.624		
Skewness	7.044		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.441	Lilliefors Test Statistic	0.376
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0843	95% H-UCL	0.0502
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0571
95% Adjusted-CLT UCL	0.0916	97.5% Chebyshev (MVUE) UCL	0.0623
95% Modified-t UCL	0.0854	99% Chebyshev (MVUE) UCL	0.0726
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.964	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0654		
nu star	320.2		
Approximate Chi Square Value (.05)	279.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0486	95% CLT UCL	0.0841
Adjusted Chi Square Value	279.4	95% Jackknife UCL	0.0843
		95% Standard Bootstrap UCL	0.0843
Anderson-Darling Test Statistic	42.85	95% Bootstrap-t UCL	0.104
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	0.11
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	0.0863
Kolmogorov-Smirnov 5% Critical Value	0.0746	95% BCA Bootstrap UCL	0.0949
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.119
		97.5% Chebyshev(Mean, Sd) UCL	0.143
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.191
95% Approximate Gamma UCL	0.0721		
95% Adjusted Gamma UCL	0.0722		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.119

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples		166	
Number of Unique Samples			151

Raw Statistics			Log-transformed Statistics		
	Minimum	16.5		Minimum of Log Data	2.803
	Maximum	591		Maximum of Log Data	6.382
	Mean	75.61		Mean of log Data	4.107
	Median	58.1		SD of log Data	0.59
	SD	73.75			
	Coefficient of Variation	0.975			
	Skewness	4.41			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.27		Lilliefors Test Statistic	0.138
	Lilliefors Critical Value	0.0688		Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	85.08		95% H-UCL	78.78
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	87.8
	95% Adjusted-CLT UCL	87.12		97.5% Chebyshev (MVUE) UCL	94.53
	95% Modified-t UCL	85.41		99% Chebyshev (MVUE) UCL	107.7
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	2.405	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	31.44			
	nu star	798.4			
	Approximate Chi Square Value (.05)	733.9	Nonparametric Statistics		
	Adjusted Level of Significance	0.0486		95% CLT UCL	85.03
	Adjusted Chi Square Value	733.3		95% Jackknife UCL	85.08
				95% Standard Bootstrap UCL	84.96
	Anderson-Darling Test Statistic	7.98		95% Bootstrap-t UCL	88.74
	Anderson-Darling 5% Critical Value	0.763		95% Hall's Bootstrap UCL	88.35
	Kolmogorov-Smirnov Test Statistic	0.195		95% Percentile Bootstrap UCL	85.62
	Kolmogorov-Smirnov 5% Critical Value	0.0732		95% BCA Bootstrap UCL	87.31
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	100.6
				97.5% Chebyshev(Mean, Sd) UCL	111.4
				99% Chebyshev(Mean, Sd) UCL	132.6
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	82.27			
	95% Adjusted Gamma UCL	82.33			
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL	100.6

Result or 1/2 SDL (tetrachlorobiphenyl (44))

General Statistics					
	Number of Valid Samples	27		Number of Unique Samples	20
Raw Statistics			Log-transformed Statistics		
	Minimum	6.3000E-5		Minimum of Log Data	-9.672
	Maximum	0.0198		Maximum of Log Data	-3.922
	Mean	9.3370E-4		Mean of log Data	-8.97
	Median	7.0500E-5		SD of log Data	1.344

SD	0.0037	
Coefficient of Variation	4.064	
Skewness	5.095	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.245	Shapiro Wilk Test Statistic	0.554
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0021	95% H-UCL	6.8092E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.0103E-4
95% Adjusted-CLT UCL	0.0029	97.5% Chebyshev (MVUE) UCL	8.7638E-4
95% Modified-t UCL	0.0023	99% Chebyshev (MVUE) UCL	0.0012
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.326	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0028		
nu star	17.61		
Approximate Chi Square Value (.05)	9.108	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.0021
Adjusted Chi Square Value	8.718	95% Jackknife UCL	0.0021
		95% Standard Bootstrap UCL	0.0021
Anderson-Darling Test Statistic	7.003	95% Bootstrap-t UCL	0.0254
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL	0.0165
Kolmogorov-Smirnov Test Statistic	0.445	95% Percentile Bootstrap UCL	0.0023
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.0031
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0041
		97.5% Chebyshev(Mean, Sd) UCL	0.0054
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0082
95% Approximate Gamma UCL	0.0018		
95% Adjusted Gamma UCL	0.0018		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0082

Result or 1/2 SDL (tetrachlorobiphenyl (52))

General Statistics

Number of Valid Samples	27	Number of Unique Samples	24
Raw Statistics		Log-transformed Statistics	
Minimum	9.9500E-5	Minimum of Log Data	-9.215
Maximum	0.0336	Maximum of Log Data	-3.393
Mean	0.0017	Mean of log Data	-8.357
Median	1.1300E-4	SD of log Data	1.409
SD	0.0065		
Coefficient of Variation	3.771		
Skewness	4.868		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.274		Shapiro Wilk Test Statistic		0.632	
Shapiro Wilk Critical Value		0.923		Shapiro Wilk Critical Value		0.923	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0038		95% H-UCL		0.0014	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0014	
95% Adjusted-CLT UCL		0.0050		97.5% Chebyshev (MVUE) UCL		0.0018	
95% Modified-t UCL		0.0040		99% Chebyshev (MVUE) UCL		0.0025	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.326		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0053					
nu star		17.59					
Approximate Chi Square Value (.05)		9.095		Nonparametric Statistics			
Adjusted Level of Significance		0.0401		95% CLT UCL		0.0037	
Adjusted Chi Square Value		8.705		95% Jackknife UCL		0.0038	
				95% Standard Bootstrap UCL		0.0037	
Anderson-Darling Test Statistic		6.223		95% Bootstrap-t UCL		0.049	
Anderson-Darling 5% Critical Value		0.844		95% Hall's Bootstrap UCL		0.0272	
Kolmogorov-Smirnov Test Statistic		0.351		95% Percentile Bootstrap UCL		0.0041	
Kolmogorov-Smirnov 5% Critical Value		0.182		95% BCA Bootstrap UCL		0.0059	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0072	
				97.5% Chebyshev(Mean, Sd) UCL		0.0095	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0142	
95% Approximate Gamma UCL		0.0033					
95% Adjusted Gamma UCL		0.0034					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.0142	
Result or 1/2 SDL (tin)							
General Statistics							
Number of Valid Samples		166		Number of Unique Samples		57	
Raw Statistics				Log-transformed Statistics			
Minimum		0.23		Minimum of Log Data		-1.47	
Maximum		6.48		Maximum of Log Data		1.869	
Mean		0.616		Mean of log Data		-0.912	
Median		0.27		SD of log Data		0.764	
SD		0.868					
Coefficient of Variation		1.409					
Skewness		3.697					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Lilliefors Test Statistic		0.33		Lilliefors Test Statistic		0.34	
Lilliefors Critical Value		0.0688		Lilliefors Critical Value		0.0688	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.727		95% H-UCL		0.605	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.693	
95% Adjusted-CLT UCL		0.748		97.5% Chebyshev (MVUE) UCL		0.761	
95% Modified-t UCL		0.731		99% Chebyshev (MVUE) UCL		0.894	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		1.292		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.477					
nu star		428.9					
Approximate Chi Square Value (.05)		381.9		Nonparametric Statistics			
Adjusted Level of Significance		0.0486		95% CLT UCL		0.727	
Adjusted Chi Square Value		381.5		95% Jackknife UCL		0.727	
				95% Standard Bootstrap UCL		0.727	
Anderson-Darling Test Statistic		26.15		95% Bootstrap-t UCL		0.759	
Anderson-Darling 5% Critical Value		0.776		95% Hall's Bootstrap UCL		0.758	
Kolmogorov-Smirnov Test Statistic		0.352		95% Percentile Bootstrap UCL		0.73	
Kolmogorov-Smirnov 5% Critical Value		0.0741		95% BCA Bootstrap UCL		0.751	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.91	
				97.5% Chebyshev(Mean, Sd) UCL		1.037	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		1.286	
95% Approximate Gamma UCL		0.692					
95% Adjusted Gamma UCL		0.693					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.91	

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples		166	
Number of Unique Samples		114	
Raw Statistics		Log-transformed Statistics	
Minimum	4.02	Minimum of Log Data	1.391
Maximum	645	Maximum of Log Data	6.469
Mean	25.77	Mean of log Data	3.014
Median	19	SD of log Data	0.484
SD	50.15		
Coefficient of Variation	1.946		
Skewness	11.61		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.375	Lilliefors Test Statistic	0.177
Lilliefors Critical Value	0.0688	Lilliefors Critical Value	0.0688
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		95% H-UCL	24.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.84
95% Adjusted-CLT UCL		97.5% Chebyshev (MVUE) UCL	28.55
95% Modified-t UCL		99% Chebyshev (MVUE) UCL	31.91

Gamma Distribution Test				Data Distribution			
k star (bias corrected)		2.243	Data do not follow a Discernable Distribution (0.05)				
Theta Star		11.49					
nu star		744.8					
Approximate Chi Square Value (.05)		682.5	Nonparametric Statistics				
Adjusted Level of Significance		0.0486	95% CLT UCL		32.17		
Adjusted Chi Square Value		681.9	95% Jackknife UCL		32.21		
			95% Standard Bootstrap UCL		32.2		
Anderson-Darling Test Statistic		6.024E+28	95% Bootstrap-t UCL		48.92		
Anderson-Darling 5% Critical Value		0.764	95% Hall's Bootstrap UCL		55.9		
Kolmogorov-Smirnov Test Statistic		0.272	95% Percentile Bootstrap UCL		33.3		
Kolmogorov-Smirnov 5% Critical Value		0.0732	95% BCA Bootstrap UCL		37.62		
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		42.74		
			97.5% Chebyshev(Mean, Sd) UCL		50.08		
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		64.5		
95% Approximate Gamma UCL		28.13					
95% Adjusted Gamma UCL		28.15					
Potential UCL to Use			Use 95% Student's-t UCL		32.21		
			or 95% Modified-t UCL		32.8		
Result or 1/2 SDL (toluene)							
General Statistics							
Number of Valid Samples		83	Number of Unique Samples		80		
Raw Statistics			Log-transformed Statistics				
Minimum		2.6100E-4	Minimum of Log Data		-8.251		
Maximum		0.106	Maximum of Log Data		-2.249		
Mean		0.0057	Mean of log Data		-5.738		
Median		0.0036	SD of log Data		1.082		
SD		0.0117					
Coefficient of Variation		2.033					
Skewness		7.835					
Relevant UCL Statistics							
Normal Distribution Test			Lognormal Distribution Test				
Lilliefors Test Statistic		0.351	Lilliefors Test Statistic		0.143		
Lilliefors Critical Value		0.0973	Lilliefors Critical Value		0.0973		
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution			Assuming Lognormal Distribution				
95% Student's-t UCL		0.0078	95% H-UCL		0.0076		
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0093		
95% Adjusted-CLT UCL		0.0090	97.5% Chebyshev (MVUE) UCL		0.0109		
95% Modified-t UCL		0.0080	99% Chebyshev (MVUE) UCL		0.014		
Gamma Distribution Test			Data Distribution				
k star (bias corrected)		0.972	Data do not follow a Discernable Distribution (0.05)				
Theta Star		0.0059					

nu star	161.4		
Approximate Chi Square Value (.05)	133	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0078
Adjusted Chi Square Value	132.5	95% Jackknife UCL	0.0078
		95% Standard Bootstrap UCL	0.0079
Anderson-Darling Test Statistic	2.348	95% Bootstrap-t UCL	0.0117
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.0159
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	0.0080
Kolmogorov-Smirnov 5% Critical Value	0.101	95% BCA Bootstrap UCL	0.0096
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0113
		97.5% Chebyshev(Mean, Sd) UCL	0.0137
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0185
95% Approximate Gamma UCL	0.0069		
95% Adjusted Gamma UCL	0.0069		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	0.0137

Result or 1/2 SDL (total moisture)

General Statistics			
Number of Valid Samples	4	Number of Unique Samples	4
Raw Statistics		Log-transformed Statistics	
Minimum	4.47	Minimum of Log Data	1.497
Maximum	7.34	Maximum of Log Data	1.993
Mean	5.813	Mean of log Data	1.742
Median	5.72	SD of log Data	0.22
SD	1.274		
Coefficient of Variation	0.219		
Skewness	0.304		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical Value	0.748	Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.312	95% H-UCL	8.384
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.589
95% Adjusted-CLT UCL	6.964	97.5% Chebyshev (MVUE) UCL	9.791
95% Modified-t UCL	7.328	99% Chebyshev (MVUE) UCL	12.15
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.11	Data appear Normal at 5% Significance Level	
Theta Star	0.817		
nu star	56.88		
Approximate Chi Square Value (.05)	40.55	Nonparametric Statistics	
Adjusted Level of Significance	N/A	95% CLT UCL	6.861
Adjusted Chi Square Value	N/A	95% Jackknife UCL	7.312
		95% Standard Bootstrap UCL	6.714

Anderson-Darling Test Statistic	0.239	95% Bootstrap-t UCL	9.165
Anderson-Darling 5% Critical Value	0.657	95% Hall's Bootstrap UCL	8.868
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	6.785
Kolmogorov-Smirnov 5% Critical Value	0.394	95% BCA Bootstrap UCL	6.575
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.59
		97.5% Chebyshev(Mean, Sd) UCL	9.792
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.15
95% Approximate Gamma UCL	8.154		
95% Adjusted Gamma UCL	N/A		
Potential UCL to Use		Use 95% Student's-t UCL	7.312

Result or 1/2 SDL (trichloroethene)

General Statistics			
Number of Valid Samples	83	Number of Unique Samples	58
Raw Statistics		Log-transformed Statistics	
Minimum	4.0500E-5	Minimum of Log Data	-10.11
Maximum	0.034	Maximum of Log Data	-3.381
Mean	9.2984E-4	Mean of log Data	-8.979
Median	8.0500E-5	SD of log Data	1.34
SD	0.0039		
Coefficient of Variation	4.295		
Skewness	7.315		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.47	Lilliefors Test Statistic	0.421
Lilliefors Critical Value	0.0973	Lilliefors Critical Value	0.0973
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0016	95% H-UCL	4.5311E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.5915E-4
95% Adjusted-CLT UCL	0.0020	97.5% Chebyshev (MVUE) UCL	6.6982E-4
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	8.8721E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0027		
nu star	55.48		
Approximate Chi Square Value (.05)	39.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0471	95% CLT UCL	0.0016
Adjusted Chi Square Value	39.12	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0016
Anderson-Darling Test Statistic	23.85	95% Bootstrap-t UCL	0.0031
Anderson-Darling 5% Critical Value	0.857	95% Hall's Bootstrap UCL	0.0041
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	0.0017
Kolmogorov-Smirnov 5% Critical Value	0.106	95% BCA Bootstrap UCL	0.0021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0028

								97.5% Chebyshev(Mean, Sd) UCL				0.0036			
Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL				0.0052			
95% Approximate Gamma UCL				0.0013											
95% Adjusted Gamma UCL				0.0013											
Potential UCL to Use								Use 97.5% Chebyshev (Mean, Sd) UCL				0.0036			
Result or 1/2 SDL (vanadium)															
General Statistics															
Number of Valid Samples				166				Number of Unique Samples				117			
Raw Statistics								Log-transformed Statistics							
Minimum				4.73				Minimum of Log Data				1.554			
Maximum				45.6				Maximum of Log Data				3.82			
Mean				14.4				Mean of log Data				2.588			
Median				13.75				SD of log Data				0.406			
SD				5.905											
Coefficient of Variation				0.41											
Skewness				1.359											
Relevant UCL Statistics															
Normal Distribution Test								Lognormal Distribution Test							
Lilliefors Test Statistic				0.0803				Lilliefors Test Statistic				0.0508			
Lilliefors Critical Value				0.0688				Lilliefors Critical Value				0.0688			
Data not Normal at 5% Significance Level								Data appear Lognormal at 5% Significance Level							
Assuming Normal Distribution								Assuming Lognormal Distribution							
95% Student's-t UCL				15.16				95% H-UCL				15.27			
95% UCLs (Adjusted for Skewness)								95% Chebyshev (MVUE) UCL				16.5			
95% Adjusted-CLT UCL				15.21				97.5% Chebyshev (MVUE) UCL				17.39			
95% Modified-t UCL				15.17				99% Chebyshev (MVUE) UCL				19.14			
Gamma Distribution Test								Data Distribution							
k star (bias corrected)				6.31				Data appear Gamma Distributed at 5% Significance Level							
Theta Star				2.283											
nu star				2095											
Approximate Chi Square Value (.05)				1989				Nonparametric Statistics							
Adjusted Level of Significance				0.0486				95% CLT UCL				15.16			
Adjusted Chi Square Value				1989				95% Jackknife UCL				15.16			
								95% Standard Bootstrap UCL				15.16			
Anderson-Darling Test Statistic				0.304				95% Bootstrap-t UCL				15.19			
Anderson-Darling 5% Critical Value				0.754				95% Hall's Bootstrap UCL				15.26			
Kolmogorov-Smirnov Test Statistic				0.0346				95% Percentile Bootstrap UCL				15.16			
Kolmogorov-Smirnov 5% Critical Value				0.0725				95% BCA Bootstrap UCL				15.19			
Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL				16.4			
								97.5% Chebyshev(Mean, Sd) UCL				17.27			
Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL				18.96			
95% Approximate Gamma UCL				15.17											
95% Adjusted Gamma UCL				15.17											

Potential UCL to Use				Use 95% Approximate Gamma UCL				15.17	
Result or 1/2 SDL (xylene (total))									
General Statistics									
Number of Valid Samples			83	Number of Unique Samples			77		
Raw Statistics				Log-transformed Statistics					
	Minimum	1.3050E-4			Minimum of Log Data	-8.944			
	Maximum	3.4			Maximum of Log Data	1.224			
	Mean	0.0479			Mean of log Data	-6.555			
	Median	0.0014			SD of log Data	1.685			
	SD	0.374							
	Coefficient of Variation	7.807							
	Skewness	9.027							
Relevant UCL Statistics									
Normal Distribution Test				Lognormal Distribution Test					
	Lilliefors Test Statistic	0.472			Lilliefors Test Statistic	0.197			
	Lilliefors Critical Value	0.0973			Lilliefors Critical Value	0.0973			
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level					
Assuming Normal Distribution				Assuming Lognormal Distribution					
	95% Student's-t UCL	0.116			95% H-UCL	0.0102			
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	0.0122			
	95% Adjusted-CLT UCL	0.159			97.5% Chebyshev (MVUE) UCL	0.0151			
	95% Modified-t UCL	0.123			99% Chebyshev (MVUE) UCL	0.0207			
Gamma Distribution Test				Data Distribution					
	k star (bias corrected)	0.209		Data do not follow a Discernable Distribution (0.05)					
	Theta Star	0.229							
	nu star	34.62							
Approximate Chi Square Value (.05)				Nonparametric Statistics					
	Adjusted Level of Significance	0.0471			95% CLT UCL	0.115			
	Adjusted Chi Square Value	21.99			95% Jackknife UCL	0.116			
					95% Standard Bootstrap UCL	0.115			
	Anderson-Darling Test Statistic	18.38			95% Bootstrap-t UCL	1.896			
	Anderson-Darling 5% Critical Value	0.907			95% Hall's Bootstrap UCL	1.317			
	Kolmogorov-Smirnov Test Statistic	0.399			95% Percentile Bootstrap UCL	0.129			
	Kolmogorov-Smirnov 5% Critical Value	0.108			95% BCA Bootstrap UCL	0.179			
Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL	0.227			
					97.5% Chebyshev(Mean, Sd) UCL	0.304			
Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL	0.456			
	95% Approximate Gamma UCL	0.0748							
	95% Adjusted Gamma UCL	0.0754							
Potential UCL to Use				Use 97.5% Chebyshev (Mean, Sd) UCL					0.304

Result or 1/2 SDL (zinc)

General Statistics					
Number of Valid Samples		166	Number of Unique Samples		159
Raw Statistics		Log-transformed Statistics			
	Minimum	6.17	Minimum of Log Data		1.82
	Maximum	7650	Maximum of Log Data		8.942
	Mean	433.8	Mean of log Data		5.141
	Median	192.5	SD of log Data		1.438
	SD	786.8			
	Coefficient of Variation	1.814			
	Skewness	5.977			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Lilliefors Test Statistic	0.293	Lilliefors Test Statistic		0.0981
	Lilliefors Critical Value	0.0688	Lilliefors Critical Value		0.0688
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	534.8	95% H-UCL		640.1
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		793.9
	95% Adjusted-CLT UCL	564.5	97.5% Chebyshev (MVUE) UCL		932.2
	95% Modified-t UCL	539.6	99% Chebyshev (MVUE) UCL		1204
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.647	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	670.5			
	nu star	214.8			
	Approximate Chi Square Value (.05)	181.9	Nonparametric Statistics		
	Adjusted Level of Significance	0.0486	95% CLT UCL		534.3
	Adjusted Chi Square Value	181.6	95% Jackknife UCL		534.8
			95% Standard Bootstrap UCL		533.1
	Anderson-Darling Test Statistic	3.192	95% Bootstrap-t UCL		586.2
	Anderson-Darling 5% Critical Value	0.805	95% Hall's Bootstrap UCL		949.7
	Kolmogorov-Smirnov Test Statistic	0.111	95% Percentile Bootstrap UCL		544.3
	Kolmogorov-Smirnov 5% Critical Value	0.0758	95% BCA Bootstrap UCL		573.3
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		700
			97.5% Chebyshev(Mean, Sd) UCL		815.2
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1041
	95% Approximate Gamma UCL	512.3			
	95% Adjusted Gamma UCL	513.1			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		815.2

APPENDIX A-3

NORTH OF MARLIN SURFACE SOIL

General UCL Statistics for Full Data Sets					
User Selected Options					
From File	J:\1352 - Gulfco RI\riskleco\Tables for Revisited SLERA\surface soil N or Marlin aug 2008.wst				
Full Precision	OFF				
Confidence Coefficient	95%				
Number of Bootstrap Operations	2000				
Result or 1/2 DL (2-methylnaphthalene)					
General Statistics					
Number of Valid Samples		18	Number of Unique Samples		15
Raw Statistics			Log-transformed Statistics		
	Minimum	0.005		Minimum of Log Data	-5.298
	Maximum	0.053		Maximum of Log Data	-2.937
	Mean	0.0123		Mean of log Data	-4.795
	Median	0.0059		SD of log Data	0.772
	SD	0.0148			
	Coefficient of Variation	1.21			
	Skewness	2.182			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.528		Shapiro Wilk Test Statistic	0.605
	Shapiro Wilk Critical Value	0.897		Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.0184		95% H-UCL	0.0173
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0202
	95% Adjusted-CLT UCL	0.02		97.5% Chebyshev (MVUE) UCL	0.0242
	95% Modified-t UCL	0.0187		99% Chebyshev (MVUE) UCL	0.0321
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	1.211	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.0101			
	nu star	43.61			
Approximate Chi Square Value (.05)			Nonparametric Statistics		
	Adjusted Level of Significance	0.0357		95% CLT UCL	0.018
	Adjusted Chi Square Value	28.35		95% Jackknife UCL	0.0184
				95% Standard Bootstrap UCL	0.0178
	Anderson-Darling Test Statistic	3.817		95% Bootstrap-t UCL	0.0243
	Anderson-Darling 5% Critical Value	0.758		95% Hall's Bootstrap UCL	0.0176
	Kolmogorov-Smirnov Test Statistic	0.442		95% Percentile Bootstrap UCL	0.0186
	Kolmogorov-Smirnov 5% Critical Value	0.208		95% BCA Bootstrap UCL	0.0202
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0275
				97.5% Chebyshev(Mean, Sd) UCL	0.0341
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.0471
	95% Approximate Gamma UCL	0.0182			
	95% Adjusted Gamma UCL	0.0189			

Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL				0.0275			
Result or 1/2 DL (4,4'-dde)											
General Statistics											
Number of Valid Samples				18		Number of Unique Samples				16	
Raw Statistics					Log-transformed Statistics						
		Minimum	1.9150E-4					Minimum of Log Data	-8.561		
		Maximum	0.0149					Maximum of Log Data	-4.206		
		Mean	0.0011					Mean of log Data	-8.002		
		Median	2.1175E-4					SD of log Data	1.162		
		SD	0.0034								
		Coefficient of Variation	2.898								
		Skewness	4.099								
Relevant UCL Statistics											
Normal Distribution Test					Lognormal Distribution Test						
		Shapiro Wilk Test Statistic	0.324					Shapiro Wilk Test Statistic	0.529		
		Shapiro Wilk Critical Value	0.897					Shapiro Wilk Critical Value	0.897		
Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level						
Assuming Normal Distribution					Assuming Lognormal Distribution						
		95% Student's-t UCL	0.0026					95% H-UCL	0.0014		
		95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	0.0014		
		95% Adjusted-CLT UCL	0.0033					97.5% Chebyshev (MVUE) UCL	0.0018		
		95% Modified-t UCL	0.0027					99% Chebyshev (MVUE) UCL	0.0025		
Gamma Distribution Test					Data Distribution						
		k star (bias corrected)	0.454					Data do not follow a Discernable Distribution (0.05)			
		Theta Star	0.0026								
		nu star	16.33								
		Approximate Chi Square Value (.05)	8.194					Nonparametric Statistics			
		Adjusted Level of Significance	0.0357					95% CLT UCL	0.0025		
		Adjusted Chi Square Value	7.645					95% Jackknife UCL	0.0026		
								95% Standard Bootstrap UCL	0.0024		
		Anderson-Darling Test Statistic	4.607					95% Bootstrap-t UCL	0.0141		
		Anderson-Darling 5% Critical Value	0.8					95% Hall's Bootstrap UCL	0.0144		
		Kolmogorov-Smirnov Test Statistic	0.483					95% Percentile Bootstrap UCL	0.0027		
		Kolmogorov-Smirnov 5% Critical Value	0.215					95% BCA Bootstrap UCL	0.0037		
Data not Gamma Distributed at 5% Significance Level							95% Chebyshev(Mean, Sd) UCL	0.0047			
							97.5% Chebyshev(Mean, Sd) UCL	0.0062			
Assuming Gamma Distribution							99% Chebyshev(Mean, Sd) UCL	0.0093			
		95% Approximate Gamma UCL	0.0023								
		95% Adjusted Gamma UCL	0.0025								
Potential UCL to Use							Use 99% Chebyshev (Mean, Sd) UCL	0.0093			
Result or 1/2 DL (4,4'-ddt)											

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum		7.4000E-5	Minimum of Log Data		-9.511
Maximum		0.0108	Maximum of Log Data		-4.528
Mean		0.0012	Mean of log Data		-7.956
Median		2.7225E-4	SD of log Data		1.604
SD		0.0026			
Coefficient of Variation		2.045			
Skewness		3.311			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.51	Shapiro Wilk Test Statistic		0.856
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0023	95% H-UCL		0.0052
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0032
95% Adjusted-CLT UCL		0.0027	97.5% Chebyshev (MVUE) UCL		0.0042
95% Modified-t UCL		0.0024	99% Chebyshev (MVUE) UCL		0.0060
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.448	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0028			
nu star		16.14			
Approximate Chi Square Value (.05)		8.064	Nonparametric Statistics		
Adjusted Level of Significance		0.0357	95% CLT UCL		0.0022
Adjusted Chi Square Value		7.52	95% Jackknife UCL		0.0023
			95% Standard Bootstrap UCL		0.0022
Anderson-Darling Test Statistic		1.361	95% Bootstrap-t UCL		0.0055
Anderson-Darling 5% Critical Value		0.801	95% Hall's Bootstrap UCL		0.0066
Kolmogorov-Smirnov Test Statistic		0.238	95% Percentile Bootstrap UCL		0.0023
Kolmogorov-Smirnov 5% Critical Value		0.215	95% BCA Bootstrap UCL		0.0029
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0039
			97.5% Chebyshev(Mean, Sd) UCL		0.0051
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0073
95% Approximate Gamma UCL		0.0025			
95% Adjusted Gamma UCL		0.0027			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.0073

Result or 1/2 DL (acenaphthene)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		13
Raw Statistics			Log-transformed Statistics		
Minimum		0.005	Minimum of Log Data		-5.298

Maximum	0.157	Maximum of Log Data	-1.852
Mean	0.0161	Mean of log Data	-4.856
Median	0.0055	SD of log Data	0.897
SD	0.0358		
Coefficient of Variation	2.227		
Skewness	4.027		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.518
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0307	95% H-UCL	0.0201
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0227
95% Adjusted-CLT UCL	0.0385	97.5% Chebyshev (MVUE) UCL	0.0276
95% Modified-t UCL	0.0321	99% Chebyshev (MVUE) UCL	0.0373
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.717	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0224		
nu star	25.83		
Approximate Chi Square Value (.05)	15.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0299
Adjusted Chi Square Value	14.47	95% Jackknife UCL	0.0307
		95% Standard Bootstrap UCL	0.0291
Anderson-Darling Test Statistic	4.505	95% Bootstrap-t UCL	0.111
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	0.114
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	0.032
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0427
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0528
		97.5% Chebyshev(Mean, Sd) UCL	0.0687
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0999
95% Approximate Gamma UCL	0.0272		
95% Adjusted Gamma UCL	0.0287		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0528

Result or 1/2 DL (acenaphthylene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0038	Minimum of Log Data	-5.562
Maximum	0.0555	Maximum of Log Data	-2.891
Mean	0.0099	Mean of log Data	-4.972
Median	0.0060	SD of log Data	0.693
SD	0.0131		
Coefficient of Variation	1.324		

Skewness				3.101				
Relevant UCL Statistics								
Normal Distribution Test				Lognormal Distribution Test				
Shapiro Wilk Test Statistic		0.443	Shapiro Wilk Test Statistic		0.613			
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897			
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL		0.0153	95% H-UCL		0.0128			
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0152		
95% Adjusted-CLT UCL		0.0174	97.5% Chebyshev (MVUE) UCL		0.0181			
95% Modified-t UCL		0.0157	99% Chebyshev (MVUE) UCL		0.0236			
Gamma Distribution Test				Data Distribution				
k star (bias corrected)		1.325	Data do not follow a Discernable Distribution (0.05)					
Theta Star		0.0074						
nu star		47.68						
Approximate Chi Square Value (.05)		32.83	Nonparametric Statistics					
Adjusted Level of Significance		0.0357	95% CLT UCL		0.015			
Adjusted Chi Square Value		31.65	95% Jackknife UCL		0.0153			
			95% Standard Bootstrap UCL		0.0146			
Anderson-Darling Test Statistic		3.815	95% Bootstrap-t UCL		0.0698			
Anderson-Darling 5% Critical Value		0.756	95% Hall's Bootstrap UCL		0.0705			
Kolmogorov-Smirnov Test Statistic		0.469	95% Percentile Bootstrap UCL		0.0155			
Kolmogorov-Smirnov 5% Critical Value		0.207	95% BCA Bootstrap UCL		0.0171			
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0234		
				97.5% Chebyshev(Mean, Sd) UCL		0.0292		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0407		
95% Approximate Gamma UCL		0.0144						
95% Adjusted Gamma UCL		0.0149						
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.0234		

Result or 1/2 DL (aluminum)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		17
Raw Statistics			Log-transformed Statistics		
	Minimum	1810		Minimum of Log Data	7.501
	Maximum	16800		Maximum of Log Data	9.729
	Mean	10673		Mean of log Data	9.189
	Median	10300		SD of log Data	0.496
	SD	3687			
	Coefficient of Variation	0.345			
	Skewness	-0.368			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.963		Shapiro Wilk Test Statistic	0.767

Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897
Data appear Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		12185	95% H-UCL		14135
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		16791
95% Adjusted-CLT UCL		12022	97.5% Chebyshev (MVUE) UCL		19299
95% Modified-t UCL		12172	99% Chebyshev (MVUE) UCL		24226
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		5.015	Data appear Normal at 5% Significance Level		
Theta Star		2128			
nu star		180.5			
Approximate Chi Square Value (.05)		150.5	Nonparametric Statistics		
Adjusted Level of Significance		0.0357	95% CLT UCL		12103
Adjusted Chi Square Value		147.8	95% Jackknife UCL		12185
			95% Standard Bootstrap UCL		12068
Anderson-Darling Test Statistic		0.664	95% Bootstrap-t UCL		12127
Anderson-Darling 5% Critical Value		0.742	95% Hall's Bootstrap UCL		12096
Kolmogorov-Smirnov Test Statistic		0.162	95% Percentile Bootstrap UCL		12042
Kolmogorov-Smirnov 5% Critical Value		0.204	95% BCA Bootstrap UCL		11983
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		14461
			97.5% Chebyshev(Mean, Sd) UCL		16100
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		19319
95% Approximate Gamma UCL		12807			
95% Adjusted Gamma UCL		13035			
Potential UCL to Use			Use 95% Student's-t UCL		12185

Result or 1/2 DL (anthracene)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		17
Raw Statistics			Log-transformed Statistics		
Minimum		0.0037	Minimum of Log Data		-5.594
Maximum		0.264	Maximum of Log Data		-1.332
Mean		0.0257	Mean of log Data		-4.612
Median		0.0061	SD of log Data		1.094
SD		0.0609			
Coefficient of Variation		2.366			
Skewness		3.946			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.38	Shapiro Wilk Test Statistic		0.67
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0507	95% H-UCL		0.0379

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0389
95% Adjusted-CLT UCL	0.0636	97.5% Chebyshev (MVUE) UCL		0.0484
95% Modified-t UCL	0.0529	99% Chebyshev (MVUE) UCL		0.0668
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.573	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0449			
nu star	20.61			
Approximate Chi Square Value (.05)	11.3	Nonparametric Statistics		
Adjusted Level of Significance	0.0357	95% CLT UCL		0.0493
Adjusted Chi Square Value	10.64	95% Jackknife UCL		0.0507
		95% Standard Bootstrap UCL		0.0491
Anderson-Darling Test Statistic	3.451	95% Bootstrap-t UCL		0.147
Anderson-Darling 5% Critical Value	0.787	95% Hall's Bootstrap UCL		0.129
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL		0.0529
Kolmogorov-Smirnov 5% Critical Value	0.213	95% BCA Bootstrap UCL		0.07
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0882
		97.5% Chebyshev(Mean, Sd) UCL		0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.168
95% Approximate Gamma UCL	0.0469			
95% Adjusted Gamma UCL	0.0498			
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL		0.168

Result or 1/2 DL (antimony)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		14
Raw Statistics			Log-transformed Statistics		
Minimum		0.095	Minimum of Log Data		-2.354
Maximum		8.09	Maximum of Log Data		2.091
Mean		1.744	Mean of log Data		-0.535
Median		0.893	SD of log Data		1.721
SD		2.146			
Coefficient of Variation		1.231			
Skewness		1.659			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.768	Shapiro Wilk Test Statistic		0.775
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		2.624	95% H-UCL		12.83
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		6.755
95% Adjusted-CLT UCL		2.787	97.5% Chebyshev (MVUE) UCL		8.738
95% Modified-t UCL		2.657	99% Chebyshev (MVUE) UCL		12.63
Gamma Distribution Test			Data Distribution		

k star (bias corrected)	0.512	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.403		
nu star	18.45		
Approximate Chi Square Value (.05)	9.713	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	2.576
Adjusted Chi Square Value	9.109	95% Jackknife UCL	2.624
		95% Standard Bootstrap UCL	2.581
Anderson-Darling Test Statistic	1.671	95% Bootstrap-t UCL	3.048
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	3.327
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	2.6
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	2.801
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.949
		97.5% Chebyshev(Mean, Sd) UCL	4.903
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.777
95% Approximate Gamma UCL	3.311		
95% Adjusted Gamma UCL	3.531		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	6.777

Result or 1/2 DL (aroclor-1254)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.0019	Minimum of Log Data	-6.258
Maximum	0.0155	Maximum of Log Data	-4.167
Mean	0.0037	Mean of log Data	-5.839
Median	0.0021	SD of log Data	0.633
SD	0.0038		
Coefficient of Variation	1.01		
Skewness	2.557		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.541	Shapiro Wilk Test Statistic	0.674
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0053	95% H-UCL	0.0049
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0059
95% Adjusted-CLT UCL	0.0058	97.5% Chebyshev (MVUE) UCL	0.0069
95% Modified-t UCL	0.0054	99% Chebyshev (MVUE) UCL	0.0089
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.76	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0021		
nu star	63.37		
Approximate Chi Square Value (.05)	46.06	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0052

Adjusted Chi Square Value	44.64	95% Jackknife UCL	0.0053
		95% Standard Bootstrap UCL	0.0052
Anderson-Darling Test Statistic	2.954	95% Bootstrap-t UCL	0.0098
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.0115
Kolmogorov-Smirnov Test Statistic	0.342	95% Percentile Bootstrap UCL	0.0053
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	0.0058
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0077
		97.5% Chebyshev(Mean, Sd) UCL	0.0094
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0127
95% Approximate Gamma UCL	0.0052		
95% Adjusted Gamma UCL	0.0053		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0077

Result or 1/2 DL (arsenic)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	5.69	Maximum of Log Data	1.739
Mean	2.522	Mean of log Data	0.778
Median	2.525	SD of log Data	0.654
SD	1.164		
Coefficient of Variation	0.461		
Skewness	0.663		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.773
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.999	95% H-UCL	3.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.546
95% Adjusted-CLT UCL	3.019	97.5% Chebyshev (MVUE) UCL	5.362
95% Modified-t UCL	3.006	99% Chebyshev (MVUE) UCL	6.966
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3	Data appear Normal at 5% Significance Level	
Theta Star	0.841		
nu star	108		
Approximate Chi Square Value (.05)	85.02	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	2.973
Adjusted Chi Square Value	83.06	95% Jackknife UCL	2.999
		95% Standard Bootstrap UCL	2.965
Anderson-Darling Test Statistic	1.238	95% Bootstrap-t UCL	3.063
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	3.234
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	2.938

Kolmogorov-Smirnov 5% Critical Value		0.205	95% BCA Bootstrap UCL		2.979
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		3.718
			97.5% Chebyshev(Mean, Sd) UCL		4.235
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		5.251
95% Approximate Gamma UCL		3.204			
95% Adjusted Gamma UCL		3.28			
Potential UCL to Use			Use 95% Student's-t UCL		2.999
Result or 1/2 DL (barium)					
General Statistics					
Number of Valid Samples		18	Number of Unique Samples		18
Raw Statistics			Log-transformed Statistics		
Minimum		46.1	Minimum of Log Data		3.831
Maximum		476	Maximum of Log Data		6.165
Mean		145.2	Mean of log Data		4.783
Median		114	SD of log Data		0.59
SD		115.8			
Coefficient of Variation		0.798			
Skewness		2.357			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.641	Shapiro Wilk Test Statistic		0.885
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		192.6	95% H-UCL		192.6
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		229.8
95% Adjusted-CLT UCL		206.3	97.5% Chebyshev (MVUE) UCL		268.4
95% Modified-t UCL		195.2	99% Chebyshev (MVUE) UCL		344.2
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		2.308	Data do not follow a Discernable Distribution (0.05)		
Theta Star		62.88			
nu star		83.1			
Approximate Chi Square Value (.05)		63.09	Nonparametric Statistics		
Adjusted Level of Significance		0.0357	95% CLT UCL		190.1
Adjusted Chi Square Value		61.42	95% Jackknife UCL		192.6
			95% Standard Bootstrap UCL		188.9
Anderson-Darling Test Statistic		1.375	95% Bootstrap-t UCL		291.7
Anderson-Darling 5% Critical Value		0.748	95% Hall's Bootstrap UCL		491.8
Kolmogorov-Smirnov Test Statistic		0.275	95% Percentile Bootstrap UCL		192.6
Kolmogorov-Smirnov 5% Critical Value		0.205	95% BCA Bootstrap UCL		203.6
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		264.2
			97.5% Chebyshev(Mean, Sd) UCL		315.6
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		416.8
95% Approximate Gamma UCL		191.2			

95% Adjusted Gamma UCL				196.4				
Potential UCL to Use					Use 95% Chebyshev (Mean, Sd) UCL			
					264.2			
Result or 1/2 DL (benzo(a)anthracene)								
General Statistics								
Number of Valid Samples				18	Number of Unique Samples			
					16			
Raw Statistics					Log-transformed Statistics			
		Minimum	0.0025			Minimum of Log Data	-5.985	
		Maximum	1.18			Maximum of Log Data	0.166	
		Mean	0.0715			Mean of log Data	-4.973	
		Median	0.0055			SD of log Data	1.392	
		SD	0.277					
		Coefficient of Variation	3.872					
		Skewness	4.239					
Relevant UCL Statistics								
Normal Distribution Test				Lognormal Distribution Test				
		Shapiro Wilk Test Statistic	0.264			Shapiro Wilk Test Statistic	0.534	
		Shapiro Wilk Critical Value	0.897			Shapiro Wilk Critical Value	0.897	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
		95% Student's-t UCL	0.185			95% H-UCL	0.0551	
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	0.0442	
		95% Adjusted-CLT UCL	0.248			97.5% Chebyshev (MVUE) UCL	0.0562	
		95% Modified-t UCL	0.196			99% Chebyshev (MVUE) UCL	0.0797	
Gamma Distribution Test				Data Distribution				
		k star (bias corrected)	0.284	Data do not follow a Discernable Distribution (0.05)				
		Theta Star	0.252					
		nu star	10.21					
		Approximate Chi Square Value (.05)	4.075	Nonparametric Statistics				
		Adjusted Level of Significance	0.0357			95% CLT UCL	0.179	
		Adjusted Chi Square Value	3.71			95% Jackknife UCL	0.185	
						95% Standard Bootstrap UCL	0.177	
		Anderson-Darling Test Statistic	5.324			95% Bootstrap-t UCL	14.79	
		Anderson-Darling 5% Critical Value	0.844			95% Hall's Bootstrap UCL	7.368	
		Kolmogorov-Smirnov Test Statistic	0.52			95% Percentile Bootstrap UCL	0.201	
		Kolmogorov-Smirnov 5% Critical Value	0.221			95% BCA Bootstrap UCL	0.266	
Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	0.356	
						97.5% Chebyshev(Mean, Sd) UCL	0.479	
Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL	0.72	
		95% Approximate Gamma UCL	0.179					
		95% Adjusted Gamma UCL	0.197					
Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL	0.72	

Result or 1/2 DL (benzo(a)pyrene)

General Statistics			
Number of Valid Samples		18	
Number of Unique Samples		18	
Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.403
Maximum	1.42	Maximum of Log Data	0.351
Mean	0.114	Mean of log Data	-4.036
Median	0.0057	SD of log Data	1.734
SD	0.33		
Coefficient of Variation	2.903		
Skewness	4.073		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.36	Shapiro Wilk Test Statistic	0.746
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.249	95% H-UCL	0.405
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.209
95% Adjusted-CLT UCL	0.322	97.5% Chebyshev (MVUE) UCL	0.27
95% Modified-t UCL	0.262	99% Chebyshev (MVUE) UCL	0.391
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.337	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.338		
nu star	12.12		
Approximate Chi Square Value (.05)	5.306	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.242
Adjusted Chi Square Value	4.879	95% Jackknife UCL	0.249
		95% Standard Bootstrap UCL	0.239
Anderson-Darling Test Statistic	2.633	95% Bootstrap-t UCL	0.832
Anderson-Darling 5% Critical Value	0.83	95% Hall's Bootstrap UCL	0.709
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	0.264
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.353
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.453
		97.5% Chebyshev(Mean, Sd) UCL	0.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.888
95% Approximate Gamma UCL	0.26		
95% Adjusted Gamma UCL	0.283		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.888

Result or 1/2 DL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples		18	
Number of Unique Samples		17	

Raw Statistics			Log-transformed Statistics		
	Minimum	0.0036	Minimum of Log Data	-5.625	
	Maximum	1.62	Maximum of Log Data	0.482	
	Mean	0.146	Mean of log Data	-3.661	
	Median	0.0228	SD of log Data	1.923	
	SD	0.374			
	Coefficient of Variation	2.566			
	Skewness	4.004			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.398	Shapiro Wilk Test Statistic	0.858	
	Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.299	95% H-UCL	1.165	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.436	
	95% Adjusted-CLT UCL	0.38	97.5% Chebyshev (MVUE) UCL	0.569	
	95% Modified-t UCL	0.313	99% Chebyshev (MVUE) UCL	0.829	
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.355	Data Follow Appr. Gamma Distribution at 5% Significance Level		
	Theta Star	0.411			
	nu star	12.79			
	Approximate Chi Square Value (.05)	5.752	Nonparametric Statistics		
	Adjusted Level of Significance	0.0357	95% CLT UCL	0.291	
	Adjusted Chi Square Value	5.305	95% Jackknife UCL	0.299	
			95% Standard Bootstrap UCL	0.287	
	Anderson-Darling Test Statistic	1.361	95% Bootstrap-t UCL	0.79	
	Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.816	
	Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	0.32	
	Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.412	
Data follow Appr. Gamma Distribution at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.531	
			97.5% Chebyshev(Mean, Sd) UCL	0.697	
			99% Chebyshev(Mean, Sd) UCL	1.024	
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	0.324			
	95% Adjusted Gamma UCL	0.352			
Potential UCL to Use			Use 95% Adjusted Gamma UCL	0.352	

Result or 1/2 DL (benzo(g,h,i)perylene)

General Statistics					
	Number of Valid Samples	18	Number of Unique Samples	16	
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0051	Minimum of Log Data	-5.269	
	Maximum	1.28	Maximum of Log Data	0.247	
	Mean	0.132	Mean of log Data	-3.564	
	Median	0.0239	SD of log Data	1.755	

SD	0.303	
Coefficient of Variation	2.288	
Skewness	3.593	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.468	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.256	95% H-UCL	0.698
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.349
95% Adjusted-CLT UCL	0.314	97.5% Chebyshev (MVUE) UCL	0.452
95% Modified-t UCL	0.267	99% Chebyshev (MVUE) UCL	0.654
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.39	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.34		
nu star	14.03		
Approximate Chi Square Value (.05)	6.589	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.25
Adjusted Chi Square Value	6.105	95% Jackknife UCL	0.256
		95% Standard Bootstrap UCL	0.241
Anderson-Darling Test Statistic	1.426	95% Bootstrap-t UCL	0.568
Anderson-Darling 5% Critical Value	0.816	95% Hall's Bootstrap UCL	0.625
Kolmogorov-Smirnov Test Statistic	0.237	95% Percentile Bootstrap UCL	0.258
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	0.346
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.443
		97.5% Chebyshev(Mean, Sd) UCL	0.578
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.842
95% Approximate Gamma UCL	0.282		
95% Adjusted Gamma UCL	0.304		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.842

Result or 1/2 DL (benzo(k)fluoranthene)

General Statistics

Number of Valid Samples		18	Number of Unique Samples		15
Raw Statistics			Log-transformed Statistics		
Minimum	0.0055		Minimum of Log Data	-5.203	
Maximum	0.799		Maximum of Log Data	-0.224	
Mean	0.0689		Mean of log Data	-4.071	
Median	0.0087		SD of log Data	1.38	
SD	0.186				
Coefficient of Variation	2.698				
Skewness	3.985				

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.374		Shapiro Wilk Test Statistic		0.711	
Shapiro Wilk Critical Value		0.897		Shapiro Wilk Critical Value		0.897	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.145		95% H-UCL		0.132	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.107	
95% Adjusted-CLT UCL		0.185		97.5% Chebyshev (MVUE) UCL		0.136	
95% Modified-t UCL		0.152		99% Chebyshev (MVUE) UCL		0.192	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.421		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.164					
nu star		15.17					
Approximate Chi Square Value (.05)		7.377		Nonparametric Statistics			
Adjusted Level of Significance		0.0357		95% CLT UCL		0.141	
Adjusted Chi Square Value		6.86		95% Jackknife UCL		0.145	
				95% Standard Bootstrap UCL		0.138	
Anderson-Darling Test Statistic		3.135		95% Bootstrap-t UCL		0.537	
Anderson-Darling 5% Critical Value		0.808		95% Hall's Bootstrap UCL		0.407	
Kolmogorov-Smirnov Test Statistic		0.418		95% Percentile Bootstrap UCL		0.152	
Kolmogorov-Smirnov 5% Critical Value		0.216		95% BCA Bootstrap UCL		0.201	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.26	
				97.5% Chebyshev(Mean, Sd) UCL		0.342	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.505	
95% Approximate Gamma UCL		0.142					
95% Adjusted Gamma UCL		0.152					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.505	
Result or 1/2 DL (beryllium)							
General Statistics							
Number of Valid Samples		18		Number of Unique Samples		16	
Raw Statistics				Log-transformed Statistics			
Minimum		0.013		Minimum of Log Data		-4.343	
Maximum		2.88		Maximum of Log Data		1.058	
Mean		0.708		Mean of log Data		-0.74	
Median		0.645		SD of log Data		1.172	
SD		0.604					
Coefficient of Variation		0.854					
Skewness		2.849					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.673		Shapiro Wilk Test Statistic		0.749	
Shapiro Wilk Critical Value		0.897		Shapiro Wilk Critical Value		0.897	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.956	95% H-UCL		2.17		
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		2.115		
95% Adjusted-CLT UCL		1.044	97.5% Chebyshev (MVUE) UCL		2.644		
95% Modified-t UCL		0.972	99% Chebyshev (MVUE) UCL		3.682		
Gamma Distribution Test			Data Distribution				
k star (bias corrected)		1.213	Data do not follow a Discernable Distribution (0.05)				
Theta Star		0.584					
nu star		43.65					
Approximate Chi Square Value (.05)		29.5	Nonparametric Statistics				
Adjusted Level of Significance		0.0357	95% CLT UCL		0.942		
Adjusted Chi Square Value		28.39	95% Jackknife UCL		0.956		
			95% Standard Bootstrap UCL		0.937		
Anderson-Darling Test Statistic		1.404	95% Bootstrap-t UCL		1.129		
Anderson-Darling 5% Critical Value		0.758	95% Hall's Bootstrap UCL		2.056		
Kolmogorov-Smirnov Test Statistic		0.251	95% Percentile Bootstrap UCL		0.954		
Kolmogorov-Smirnov 5% Critical Value		0.208	95% BCA Bootstrap UCL		1.031		
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		1.329		
			97.5% Chebyshev(Mean, Sd) UCL		1.597		
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		2.125		
95% Approximate Gamma UCL		1.047					
95% Adjusted Gamma UCL		1.088					
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		2.125		
Result or 1/2 DL (bis(2-ethylhexyl)phthalate)							
General Statistics							
Number of Valid Samples		18	Number of Unique Samples		18		
Raw Statistics			Log-transformed Statistics				
Minimum		0.0122	Minimum of Log Data		-4.406		
Maximum		0.239	Maximum of Log Data		-1.431		
Mean		0.0462	Mean of log Data		-3.333		
Median		0.0302	SD of log Data		0.638		
SD		0.0502					
Coefficient of Variation		1.087					
Skewness		3.679					
Relevant UCL Statistics							
Normal Distribution Test			Lognormal Distribution Test				
Shapiro Wilk Test Statistic		0.51	Shapiro Wilk Test Statistic		0.875		
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897		
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution			Assuming Lognormal Distribution				
95% Student's-t UCL		0.0668	95% H-UCL		0.0612		
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.073		
95% Adjusted-CLT UCL		0.0766	97.5% Chebyshev (MVUE) UCL		0.0859		
95% Modified-t UCL		0.0685	99% Chebyshev (MVUE) UCL		0.111		

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Result or 1/2 DL (boron)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		18
Raw Statistics			Log-transformed Statistics		
Minimum		0.555	Minimum of Log Data		-0.589
Maximum		39.2	Maximum of Log Data		3.669
Mean		8.028	Mean of log Data		1.381
Median		5.12	SD of log Data		1.371
SD		9.477			
Coefficient of Variation		1.18			
Skewness		2.32			

Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic	0.742			Shapiro Wilk Test Statistic	0.888		
Shapiro Wilk Critical Value	0.897			Shapiro Wilk Critical Value	0.897		
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL	11.91			95% H-UCL	29.94		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	24.56		
95% Adjusted-CLT UCL	13.01			97.5% Chebyshev (MVUE) UCL	31.16		
95% Modified-t UCL	12.12			99% Chebyshev (MVUE) UCL	44.12		

Gamma Distribution Test		Data Distribution
k star (bias corrected)	0.738	Data appear Gamma Distributed at 5% Significance Level
Theta Star	10.88	
nu star	26.55	

Approximate Chi Square Value (.05)	15.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	11.7
Adjusted Chi Square Value	15.01	95% Jackknife UCL	11.91
		95% Standard Bootstrap UCL	11.67
Anderson-Darling Test Statistic	0.516	95% Bootstrap-t UCL	15.02
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	27.35
Kolmogorov-Smirnov Test Statistic	0.174	95% Percentile Bootstrap UCL	12.15
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	13.52
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.76
		97.5% Chebyshev(Mean, Sd) UCL	21.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.25
95% Approximate Gamma UCL	13.49		
95% Adjusted Gamma UCL	14.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	13.49

Result or 1/2 DL (butyl benzyl phthalate)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.389
Maximum	0.151	Maximum of Log Data	-1.89
Mean	0.016	Mean of log Data	-4.8
Median	0.0067	SD of log Data	0.851
SD	0.0344		
Coefficient of Variation	2.146		
Skewness	3.972		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.543
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0302	95% H-UCL	0.0196
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0225
95% Adjusted-CLT UCL	0.0375	97.5% Chebyshev (MVUE) UCL	0.0272
95% Modified-t UCL	0.0314	99% Chebyshev (MVUE) UCL	0.0365
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.769	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0209		
nu star	27.67		
Approximate Chi Square Value (.05)	16.67	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0294
Adjusted Chi Square Value	15.85	95% Jackknife UCL	0.0302
		95% Standard Bootstrap UCL	0.0295
Anderson-Darling Test Statistic	4.475	95% Bootstrap-t UCL	0.385

Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	0.242
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	0.0308
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	0.0403
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0514
		97.5% Chebyshev(Mean, Sd) UCL	0.0667
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0968
95% Approximate Gamma UCL	0.0266		
95% Adjusted Gamma UCL	0.028		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0514

Result or 1/2 DL (cadmium)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	0.003	Minimum of Log Data	-5.809
Maximum	0.8	Maximum of Log Data	-0.223
Mean	0.207	Mean of log Data	-3.089
Median	0.0135	SD of log Data	2.132
SD	0.252		
Coefficient of Variation	1.218		
Skewness	0.938		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.779	Shapiro Wilk Test Statistic	0.811
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.31	95% H-UCL	4.758
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.167
95% Adjusted-CLT UCL	0.319	97.5% Chebyshev (MVUE) UCL	1.534
95% Modified-t UCL	0.313	99% Chebyshev (MVUE) UCL	2.253
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.395	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.524		
nu star	14.22		
Approximate Chi Square Value (.05)	6.721	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.305
Adjusted Chi Square Value	6.231	95% Jackknife UCL	0.31
		95% Standard Bootstrap UCL	0.3
Anderson-Darling Test Statistic	1.701	95% Bootstrap-t UCL	0.33
Anderson-Darling 5% Critical Value	0.815	95% Hall's Bootstrap UCL	0.319
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	0.303
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	0.312
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.466
		97.5% Chebyshev(Mean, Sd) UCL	0.578

Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.799
95% Approximate Gamma UCL		0.438				
95% Adjusted Gamma UCL		0.473				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL			0.799
Result or 1/2 DL (carbazole)						
General Statistics						
Number of Valid Samples		18	Number of Unique Samples		16	
Raw Statistics			Log-transformed Statistics			
Minimum		0.0048	Minimum of Log Data		-5.334	
Maximum		0.128	Maximum of Log Data		-2.056	
Mean		0.0153	Mean of log Data		-4.778	
Median		0.0055	SD of log Data		0.879	
SD		0.0289				
Coefficient of Variation		1.885				
Skewness		3.888				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.401	Shapiro Wilk Test Statistic		0.656	
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.0272	95% H-UCL		0.021	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0239	
95% Adjusted-CLT UCL		0.0332	97.5% Chebyshev (MVUE) UCL		0.029	
95% Modified-t UCL		0.0282	99% Chebyshev (MVUE) UCL		0.0391	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.841	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0182				
nu star		30.27				
Approximate Chi Square Value (.05)		18.71	Nonparametric Statistics			
Adjusted Level of Significance		0.0357	95% CLT UCL		0.0265	
Adjusted Chi Square Value		17.84	95% Jackknife UCL		0.0272	
			95% Standard Bootstrap UCL		0.0262	
Anderson-Darling Test Statistic		3.213	95% Bootstrap-t UCL		0.0712	
Anderson-Darling 5% Critical Value		0.768	95% Hall's Bootstrap UCL		0.0646	
Kolmogorov-Smirnov Test Statistic		0.404	95% Percentile Bootstrap UCL		0.0278	
Kolmogorov-Smirnov 5% Critical Value		0.21	95% BCA Bootstrap UCL		0.0357	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.045	
			97.5% Chebyshev(Mean, Sd) UCL		0.0579	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0831	
95% Approximate Gamma UCL		0.0248				
95% Adjusted Gamma UCL		0.026				
Potential UCL to Use			Use 95% Chebvshev (Mean, Sd) UCL		0.045	

Result or 1/2 DL (chromium)			
General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	7.9	Minimum of Log Data	2.067
Maximum	128	Maximum of Log Data	4.852
Mean	20.26	Mean of log Data	2.683
Median	11.6	SD of log Data	0.658
SD	27.58		
Coefficient of Variation	1.361		
Skewness	3.912		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.425	Shapiro Wilk Test Statistic	0.74
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	31.56	95% H-UCL	25.79
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.69
95% Adjusted-CLT UCL	37.35	97.5% Chebyshev (MVUE) UCL	36.22
95% Modified-t UCL	32.56	99% Chebyshev (MVUE) UCL	47.08
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.441	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.06		
nu star	51.88		
Approximate Chi Square Value (.05)	36.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	30.95
Adjusted Chi Square Value	35.09	95% Jackknife UCL	31.56
		95% Standard Bootstrap UCL	30.82
Anderson-Darling Test Statistic	2.456	95% Bootstrap-t UCL	67.02
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	67.3
Kolmogorov-Smirnov Test Statistic	0.331	95% Percentile Bootstrap UCL	32.34
Kolmogorov-Smirnov 5% Critical Value	0.207	95% BCA Bootstrap UCL	39.83
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48.59
		97.5% Chebyshev(Mean, Sd) UCL	60.85
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	84.93
95% Approximate Gamma UCL	28.92		
95% Adjusted Gamma UCL	29.95		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	48.59

Result or 1/2 DL (chrysene)

General Statistics

Number of Valid Samples		18	Number of Unique Samples		17
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0045		Minimum of Log Data	-5.392
	Maximum	1.3		Maximum of Log Data	0.262
	Mean	0.102		Mean of log Data	-4.114
	Median	0.0051		SD of log Data	1.687
	SD	0.302			
	Coefficient of Variation	2.951			
	Skewness	4.085			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.354		Shapiro Wilk Test Statistic	0.77
	Shapiro Wilk Critical Value	0.897		Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.226		95% H-UCL	0.319
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.177
	95% Adjusted-CLT UCL	0.293		97.5% Chebyshev (MVUE) UCL	0.229
	95% Modified-t UCL	0.238		99% Chebyshev (MVUE) UCL	0.33
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.34	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.301			
	nu star	12.25			
	Approximate Chi Square Value (.05)	5.394	Nonparametric Statistics		
	Adjusted Level of Significance	0.0357		95% CLT UCL	0.22
	Adjusted Chi Square Value	4.962		95% Jackknife UCL	0.226
				95% Standard Bootstrap UCL	0.215
	Anderson-Darling Test Statistic	2.54		95% Bootstrap-t UCL	0.797
	Anderson-Darling 5% Critical Value	0.829		95% Hall's Bootstrap UCL	0.622
	Kolmogorov-Smirnov Test Statistic	0.295		95% Percentile Bootstrap UCL	0.242
	Kolmogorov-Smirnov 5% Critical Value	0.219		95% BCA Bootstrap UCL	0.324
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.413
				97.5% Chebyshev(Mean, Sd) UCL	0.548
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.812
	95% Approximate Gamma UCL	0.233			
	95% Adjusted Gamma UCL	0.253			
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL	0.812

Result or 1/2 DL (cobalt)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		18
Raw Statistics			Log-transformed Statistics		
	Minimum	2.81		Minimum of Log Data	1.033
	Maximum	7.87		Maximum of Log Data	2.063

Mean	5.789	Mean of log Data	1.718
Median	5.84	SD of log Data	0.299
SD	1.506		
Coefficient of Variation	0.26		
Skewness	-0.505		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.406	95% H-UCL	6.668
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.623
95% Adjusted-CLT UCL	6.328	97.5% Chebyshev (MVUE) UCL	8.407
95% Modified-t UCL	6.399	99% Chebyshev (MVUE) UCL	9.946
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.08	Data appear Normal at 5% Significance Level	
Theta Star	0.522		
nu star	399		
Approximate Chi Square Value (.05)	353.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	6.373
Adjusted Chi Square Value	349.6	95% Jackknife UCL	6.406
		95% Standard Bootstrap UCL	6.355
Anderson-Darling Test Statistic	0.559	95% Bootstrap-t UCL	6.36
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	6.317
Kolmogorov-Smirnov Test Statistic	0.143	95% Percentile Bootstrap UCL	6.351
Kolmogorov-Smirnov 5% Critical Value	0.203	95% BCA Bootstrap UCL	6.292
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.336
		97.5% Chebyshev(Mean, Sd) UCL	8.006
		99% Chebyshev(Mean, Sd) UCL	9.321
Assuming Gamma Distribution			
95% Approximate Gamma UCL	6.53		
95% Adjusted Gamma UCL	6.607		
Potential UCL to Use		Use 95% Student's-t UCL	6.406

Result or 1/2 DL (copper)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	5.9	Minimum of Log Data	1.775
Maximum	200	Maximum of Log Data	5.298
Mean	24.13	Mean of log Data	2.621
Median	9.895	SD of log Data	0.865
SD	44.66		
Coefficient of Variation	1.851		
Skewness	4.008		

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.401		Shapiro Wilk Test Statistic	0.799	
Shapiro Wilk Critical Value	0.897		Shapiro Wilk Critical Value	0.897	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	42.44		95% H-UCL	33.52	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	38.28	
95% Adjusted-CLT UCL	52.07		97.5% Chebyshev (MVUE) UCL	46.43	
95% Modified-t UCL	44.1		99% Chebyshev (MVUE) UCL	62.43	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.889		Data do not follow a Discernable Distribution (0.05)		
Theta Star	27.13				
nu star	32.02				
Approximate Chi Square Value (.05)	20.09		Nonparametric Statistics		
Adjusted Level of Significance	0.0357		95% CLT UCL	41.44	
Adjusted Chi Square Value	19.18		95% Jackknife UCL	42.44	
			95% Standard Bootstrap UCL	41.19	
Anderson-Darling Test Statistic	2.14		95% Bootstrap-t UCL	104.9	
Anderson-Darling 5% Critical Value	0.766		95% Hall's Bootstrap UCL	104	
Kolmogorov-Smirnov Test Statistic	0.271		95% Percentile Bootstrap UCL	44.28	
Kolmogorov-Smirnov 5% Critical Value	0.209		95% BCA Bootstrap UCL	55.66	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	70.01	
			97.5% Chebyshev(Mean, Sd) UCL	89.86	
			99% Chebyshev(Mean, Sd) UCL	128.9	
Assuming Gamma Distribution					
95% Approximate Gamma UCL	38.46				
95% Adjusted Gamma UCL	40.28				
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		

Result or 1/2 DL (dibenz(a,h)anthracene)

General Statistics					
Number of Valid Samples	18		Number of Unique Samples	16	
Raw Statistics			Log-transformed Statistics		
Minimum	0.0034		Minimum of Log Data	-5.674	
Maximum	0.404		Maximum of Log Data	-0.906	
Mean	0.0471		Mean of log Data	-4.462	
Median	0.0054		SD of log Data	1.498	
SD	0.101				
Coefficient of Variation	2.145				
Skewness	3.017				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.501		Shapiro Wilk Test Statistic	0.7	
Shapiro Wilk Critical Value	0.897		Shapiro Wilk Critical Value	0.897	

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0885		95% H-UCL		0.125	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			
95% Adjusted-CLT UCL		0.104		97.5% Chebyshev (MVUE) UCL		0.114	
95% Modified-t UCL		0.0913		99% Chebyshev (MVUE) UCL		0.162	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.419		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.112					
nu star		15.07					
Approximate Chi Square Value (.05)		7.313		Nonparametric Statistics			
Adjusted Level of Significance		0.0357		95% CLT UCL		0.0862	
Adjusted Chi Square Value		6.798		95% Jackknife UCL		0.0885	
				95% Standard Bootstrap UCL		0.0843	
Anderson-Darling Test Statistic		3.091		95% Bootstrap-t UCL		0.148	
Anderson-Darling 5% Critical Value		0.809		95% Hall's Bootstrap UCL		0.18	
Kolmogorov-Smirnov Test Statistic		0.429		95% Percentile Bootstrap UCL		0.088	
Kolmogorov-Smirnov 5% Critical Value		0.216		95% BCA Bootstrap UCL		0.105	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.151	
				97.5% Chebyshev(Mean, Sd) UCL		0.196	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.284	
95% Approximate Gamma UCL		0.0971					
95% Adjusted Gamma UCL		0.104					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.284	

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum		0.0030	Minimum of Log Data		-5.799
Maximum		0.0862	Maximum of Log Data		-2.451
Mean		0.0129	Mean of log Data		-4.835
Median		0.0075	SD of log Data		0.834
SD		0.0201			
Coefficient of Variation		1.556			
Skewness		3.331			

95% Adjusted-CLT UCL	0.0247	97.5% Chebyshev (MVUE) UCL	0.0256
95% Modified-t UCL	0.0218	99% Chebyshev (MVUE) UCL	0.0342
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.006	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0129		
nu star	36.23		
Approximate Chi Square Value (.05)	23.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0207
Adjusted Chi Square Value	22.47	95% Jackknife UCL	0.0212
		95% Standard Bootstrap UCL	0.0206
Anderson-Darling Test Statistic	3.039	95% Bootstrap-t UCL	0.0773
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	0.0886
Kolmogorov-Smirnov Test Statistic	0.443	95% Percentile Bootstrap UCL	0.0213
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.0258
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0336
		97.5% Chebyshev(Mean, Sd) UCL	0.0426
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0602
95% Approximate Gamma UCL	0.02		
95% Adjusted Gamma UCL	0.0209		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0336

Result or 1/2 DL (dieltrin)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	8.2500E-5	Minimum of Log Data	-9.403
Maximum	0.0054	Maximum of Log Data	-5.212
Mean	4.8661E-4	Mean of log Data	-8.757
Median	9.1250E-5	SD of log Data	1.152
SD	0.0012		
Coefficient of Variation	2.608		
Skewness	3.946		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.362	Shapiro Wilk Test Statistic	0.621
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0010	95% H-UCL	6.8487E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.7672E-4
95% Adjusted-CLT UCL	0.0012	97.5% Chebyshev (MVUE) UCL	8.4448E-4
95% Modified-t UCL	0.0010	99% Chebyshev (MVUE) UCL	0.0011
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.499	Data do not follow a Discernable Distribution (0.05)	

Theta Star	9.7586E-4		
nu star	17.95		
Approximate Chi Square Value (.05)	9.356	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	9.7856E-4
Adjusted Chi Square Value	8.764	95% Jackknife UCL	0.0010
		95% Standard Bootstrap UCL	9.7408E-4
Anderson-Darling Test Statistic	3.815	95% Bootstrap-t UCL	0.0056
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	0.0043
Kolmogorov-Smirnov Test Statistic	0.405	95% Percentile Bootstrap UCL	0.0010
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.0013
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0017
		97.5% Chebyshev(Mean, Sd) UCL	0.0023
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0034
95% Approximate Gamma UCL	9.3369E-4		
95% Adjusted Gamma UCL	9.9676E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0034

Result or 1/2 DL (diethyl phthalate)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.578
Maximum	0.0498	Maximum of Log Data	-3
Mean	0.0113	Mean of log Data	-4.651
Median	0.0093	SD of log Data	.0521
SD	0.0098		
Coefficient of Variation	0.874		
Skewness	3.836		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.447	Shapiro Wilk Test Statistic	0.715
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0154	95% H-UCL	0.0142
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0169
95% Adjusted-CLT UCL	0.0174	97.5% Chebyshev (MVUE) UCL	0.0195
95% Modified-t UCL	0.0157	99% Chebyshev (MVUE) UCL	0.0246
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.625	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0043		
nu star	94.5		
Approximate Chi Square Value (.05)	73.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0151
Adjusted Chi Square Value	71.27	95% Jackknife UCL	0.0154

[illegible]

Result or 1/2 DL (di-n-butyl phthalate)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17
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Raw Statistics

Minimum	0.0039
Maximum	0.0835
Mean	0.0179
Median	0.0155
SD	0.0173
Variation	0.966
Skewness	3.497

Log-transformed Statistics

Minimum of Log Data	-5.525
Maximum of Log Data	-2.483
Mean of log Data	-4.275
SD of log Data	0.702

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.528
Shapiro Wilk Critical Value	0.897

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical Value	0.897

Data not Normal at 5% Significance Level

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 0.025

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	0.0282
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95% Modified-t UCL	0.0256
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Assuming Lognormal Distribution

95% H-UCL 0.0261

95% Chebyshev (MVUE) UCL	0.0309
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97.5% Chebyshev (MVUE) UCL	0.0367
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99% Chebyshev (MVUE) UCL	0.0481
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Gamma Distribution Test

k star (bias corrected)	1.805
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Theta Star	0.0099
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nu star 65

Data Distribution

Data do not follow a Discernable Distribution (0.05)

Approximate Chi Square Value (.05) 47.45

Adjusted Level of Significance 0.0357

Adjusted Chi Square Value	46.01
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Nonparametric Statistics

95% CLT UCL 0.0246

95% Jackknife UCL	0.025
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95% Standard Bootstrap UCL 0.0245

95% Bootstrap-t UCL 0.0357

95% Hall's Bootstrap UCL 0.0579

95% Percentile Bootstrap UCL 0.0254

95% BCA Bootstrap UCL 0.0302

Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0357
				97.5% Chebyshev(Mean, Sd) UCL		0.0434
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0585
95% Approximate Gamma UCL		0.0246				
95% Adjusted Gamma UCL		0.0253				
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.0357
Result or 1/2 DL (di-n-octyl phthalate)						
General Statistics						
Number of Valid Samples		18	Number of Unique Samples		16	
Raw Statistics			Log-transformed Statistics			
Minimum		0.0042	Minimum of Log Data		-5.463	
Maximum		0.123	Maximum of Log Data		-2.096	
Mean		0.0144	Mean of log Data		-4.844	
Median		0.0047	SD of log Data		0.879	
SD		0.0276				
Coefficient of Variation		1.926				
Skewness		3.985				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.391	Shapiro Wilk Test Statistic		0.708	
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.0257	95% H-UCL		0.0197	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0224	
95% Adjusted-CLT UCL		0.0316	97.5% Chebyshev (MVUE) UCL		0.0272	
95% Modified-t UCL		0.0267	99% Chebyshev (MVUE) UCL		0.0366	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.842	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0171				
nu star		30.3				
Approximate Chi Square Value (.05)		18.73	Nonparametric Statistics			
Adjusted Level of Significance		0.0357	95% CLT UCL		0.0251	
Adjusted Chi Square Value		17.86	95% Jackknife UCL		0.0257	
			95% Standard Bootstrap UCL		0.0253	
Anderson-Darling Test Statistic		2.764	95% Bootstrap-t UCL		0.075	
Anderson-Darling 5% Critical Value		0.768	95% Hall's Bootstrap UCL		0.0654	
Kolmogorov-Smirnov Test Statistic		0.319	95% Percentile Bootstrap UCL		0.0273	
Kolmogorov-Smirnov 5% Critical Value		0.21	95% BCA Bootstrap UCL		0.0341	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0428	
			97.5% Chebyshev(Mean, Sd) UCL		0.0551	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0792	
95% Approximate Gamma UCL		0.0232				
95% Adjusted Gamma UCL		0.0244				

Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL			
				0.0428			
Result or 1/2 DL (endrin)							
General Statistics							
Number of Valid Samples		18		Number of Unique Samples		17	
Raw Statistics				Log-transformed Statistics			
Minimum		1.0000E-4		Minimum of Log Data		-9.21	
Maximum		0.0014		Maximum of Log Data		-6.509	
Mean		3.0408E-4		Mean of log Data		-8.649	
Median		1.1075E-4		SD of log Data		0.908	
SD		4.4300E-4					
Coefficient of Variation		1.457					
Skewness		2.426					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.511		Shapiro Wilk Test Statistic		0.646	
Shapiro Wilk Critical Value		0.897		Shapiro Wilk Critical Value		0.897	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		4.8573E-4		95% H-UCL		4.6104E-4	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		5.1891E-4	
95% Adjusted-CLT UCL		5.3964E-4		97.5% Chebyshev (MVUE) UCL		6.3236E-4	
95% Modified-t UCL		4.9568E-4		99% Chebyshev (MVUE) UCL		8.5520E-4	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.906		Data do not follow a Discernable Distribution (0.05)			
Theta Star		3.3553E-4					
nu star		32.63					
Approximate Chi Square Value (.05)		20.57		Nonparametric Statistics			
Adjusted Level of Significance		0.0357		95% CLT UCL		4.7583E-4	
Adjusted Chi Square Value		19.65		95% Jackknife UCL		4.8573E-4	
				95% Standard Bootstrap UCL		4.7115E-4	
Anderson-Darling Test Statistic		3.335		95% Bootstrap-t UCL		9.7138E-4	
Anderson-Darling 5% Critical Value		0.766		95% Hall's Bootstrap UCL		0.0011	
Kolmogorov-Smirnov Test Statistic		0.413		95% Percentile Bootstrap UCL		4.9036E-4	
Kolmogorov-Smirnov 5% Critical Value		0.209		95% BCA Bootstrap UCL		5.6164E-4	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		7.5922E-4	
				97.5% Chebyshev(Mean, Sd) UCL		9.5616E-4	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0013	
95% Approximate Gamma UCL		4.8233E-4					
95% Adjusted Gamma UCL		5.0484E-4					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		7.5922E-4	
Result or 1/2 DL (endrin aldehyde)							

General Statistics			
Number of Valid Samples		18	Number of Unique Samples 16
Raw Statistics		Log-transformed Statistics	
Minimum	1.9750E-4	Minimum of Log Data	-8.53
Maximum	0.0016	Maximum of Log Data	-6.413
Mean	3.3575E-4	Mean of log Data	-8.206
Median	2.1825E-4	SD of log Data	0.538
SD	3.4111E-4		
Coefficient of Variation	1.016		
Skewness	3.689		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.628
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.7561E-4	95% H-UCL	4.1301E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.9211E-4
95% Adjusted-CLT UCL	5.4269E-4	97.5% Chebyshev (MVUE) UCL	5.6981E-4
95% Modified-t UCL	4.8726E-4	99% Chebyshev (MVUE) UCL	7.2243E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.175	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.5434E-4		
nu star	78.31		
Approximate Chi Square Value (.05)	58.93	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	4.6800E-4
Adjusted Chi Square Value	57.31	95% Jackknife UCL	4.7561E-4
		95% Standard Bootstrap UCL	4.6765E-4
Anderson-Darling Test Statistic	3.127	95% Bootstrap-t UCL	9.5486E-4
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	9.2712E-4
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	4.8614E-4
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	5.9244E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.8620E-4
		97.5% Chebyshev(Mean, Sd) UCL	8.3784E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0011
95% Approximate Gamma UCL	4.4622E-4		
95% Adjusted Gamma UCL	4.5878E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.8620E-4

Result or 1/2 DL (endrin ketone)

General Statistics			
Number of Valid Samples		18	Number of Unique Samples 18
Raw Statistics		Log-transformed Statistics	

Minimum	2.4750E-4	Minimum of Log Data	-8.304
Maximum	0.0096	Maximum of Log Data	-4.64
Mean	8.7406E-4	Mean of log Data	-7.889
Median	2.7375E-4	SD of log Data	0.918
SD	0.0022		
Coefficient of Variation	2.531		
Skewness	4.128		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.312	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0017	95% H-UCL	0.001
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0011
95% Adjusted-CLT UCL	0.0022	97.5% Chebyshev (MVUE) UCL	0.0013
95% Modified-t UCL	0.0018	99% Chebyshev (MVUE) UCL	0.0018
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.631	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
nu star	22.7		
Approximate Chi Square Value (.05)	12.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0017
Adjusted Chi Square Value	12.16	95% Jackknife UCL	0.0017
		95% Standard Bootstrap UCL	0.0017
Anderson-Darling Test Statistic	4.879	95% Bootstrap-t UCL	0.0203
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.0194
Kolmogorov-Smirnov Test Statistic	0.476	95% Percentile Bootstrap UCL	0.0018
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	0.0028
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0031
		97.5% Chebyshev(Mean, Sd) UCL	0.0041
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0060
95% Approximate Gamma UCL	0.0015		
95% Adjusted Gamma UCL	0.0016		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0031

Result or 1/2 DL (fluoranthene)

General Statistics

Number of Valid Samples		18	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum	0.0033		Minimum of Log Data	-5.69	
Maximum	2.19		Maximum of Log Data	0.784	
Mean	0.159		Mean of log Data	-3.978	
Median	0.0064		SD of log Data	1.767	
SD	0.511				

Coefficient of Variation		3.208		
Skewness		4.123		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.334	Shapiro Wilk Test Statistic 0.777	
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value 0.897	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL		0.369	95% H-UCL 0.481	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL 0.236	
95% Adjusted-CLT UCL		0.483	97.5% Chebyshev (MVUE) UCL 0.305	
95% Modified-t UCL		0.389	99% Chebyshev (MVUE) UCL 0.443	
Gamma Distribution Test			Data Distribution	
k star (bias corrected)		0.303	Data do not follow a Discernable Distribution (0.05)	
Theta Star		0.526		
nu star		10.9		
Approximate Chi Square Value (.05)		4.51	Nonparametric Statistics	
Adjusted Level of Significance		0.0357	95% CLT UCL 0.358	
Adjusted Chi Square Value		4.122	95% Jackknife UCL 0.369	
			95% Standard Bootstrap UCL 0.357	
Anderson-Darling Test Statistic		2.855	95% Bootstrap-t UCL 1.743	
Anderson-Darling 5% Critical Value		0.838	95% Hall's Bootstrap UCL 1.443	
Kolmogorov-Smirnov Test Statistic		0.332	95% Percentile Bootstrap UCL 0.392	
Kolmogorov-Smirnov 5% Critical Value		0.22	95% BCA Bootstrap UCL 0.53	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL 0.685	
			97.5% Chebyshev(Mean, Sd) UCL 0.912	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL 1.358	
95% Approximate Gamma UCL		0.385		
95% Adjusted Gamma UCL		0.421		
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL 1.358	

Result or 1/2 DL (fluorene)

General Statistics					
Number of Valid Samples		18	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum		0.0034	Minimum of Log Data		-5.671
Maximum		0.141	Maximum of Log Data		-1.959
Mean		0.0163	Mean of log Data		-4.835
Median		0.0054	SD of log Data		0.973
SD		0.0324			
Coefficient of Variation		1.986			
Skewness		3.744			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		

Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.679
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0296	95% H-UCL	0.0236
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0259
95% Adjusted-CLT UCL	0.0361	97.5% Chebyshev (MVUE) UCL	0.0318
95% Modified-t UCL	0.0307	99% Chebyshev (MVUE) UCL	0.0433
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.722	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0226		
nu star	25.98		
Approximate Chi Square Value (.05)	15.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0289
Adjusted Chi Square Value	14.58	95% Jackknife UCL	0.0296
		95% Standard Bootstrap UCL	0.0283
Anderson-Darling Test Statistic	3.308	95% Bootstrap-t UCL	0.0734
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	0.0694
Kolmogorov-Smirnov Test Statistic	0.441	95% Percentile Bootstrap UCL	0.0303
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0394
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0496
		97.5% Chebyshev(Mean, Sd) UCL	0.064
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0923
95% Approximate Gamma UCL	0.0276		
95% Adjusted Gamma UCL	0.0291		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0496

Result or 1/2 DL (indeno(1,2,3-cd)pyrene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.0082	Minimum of Log Data	-4.798
Maximum	1.51	Maximum of Log Data	0.412
Mean	0.151	Mean of log Data	-3.227
Median	0.0338	SD of log Data	1.61
SD	0.349		
Coefficient of Variation	2.305		
Skewness	3.88		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.433	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	

95% Student's-t UCL		0.294	95% H-UCL		0.604
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.373
95% Adjusted-CLT UCL		0.367	97.5% Chebyshev (MVUE) UCL		0.48
95% Modified-t UCL		0.307	99% Chebyshev (MVUE) UCL		0.691
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.435	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.347			
nu star		15.68			
Approximate Chi Square Value (.05)		7.735	Nonparametric Statistics		
Adjusted Level of Significance		0.0357	95% CLT UCL		0.286
Adjusted Chi Square Value		7.204	95% Jackknife UCL		0.294
			95% Standard Bootstrap UCL		0.283
Anderson-Darling Test Statistic		1.422	95% Bootstrap-t UCL		0.715
Anderson-Darling 5% Critical Value		0.805	95% Hall's Bootstrap UCL		0.755
Kolmogorov-Smirnov Test Statistic		0.238	95% Percentile Bootstrap UCL		0.31
Kolmogorov-Smirnov 5% Critical Value		0.216	95% BCA Bootstrap UCL		0.406
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.509
			97.5% Chebyshev(Mean, Sd) UCL		0.664
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.969
95% Approximate Gamma UCL		0.306			
95% Adjusted Gamma UCL		0.329			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.969
Result or 1/2 DL (iron)					
General Statistics					
Number of Valid Samples		18	Number of Unique Samples		18
Raw Statistics			Log-transformed Statistics		
Minimum		8450	Minimum of Log Data		9.042
Maximum		102000	Maximum of Log Data		11.53
Mean		19477	Mean of log Data		9.653
Median		14700	SD of log Data		0.564
SD		21073			
Coefficient of Variation		1.082			
Skewness		3.929			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.446	Shapiro Wilk Test Statistic		0.786
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		28117	95% H-UCL		24305
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		28989
95% Adjusted-CLT UCL		32561	97.5% Chebyshev (MVUE) UCL		33713
95% Modified-t UCL		28884	99% Chebyshev (MVUE) UCL		42995

Gamma Distribution Test				Data Distribution	
k star (bias corrected)	2.024	Data do not follow a Discernable Distribution (0.05)			
Theta Star	9622				
nu star	72.87				
Approximate Chi Square Value (.05)	54.22	Nonparametric Statistics			
Adjusted Level of Significance	0.0357	95% CLT UCL		27646	
Adjusted Chi Square Value	52.67	95% Jackknife UCL		28117	
		95% Standard Bootstrap UCL		27363	
Anderson-Darling Test Statistic	1.88	95% Bootstrap-t UCL		50030	
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL		59925	
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL		29158	
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL		34109	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		41127	
		97.5% Chebyshev(Mean, Sd) UCL		50495	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		68897	
95% Approximate Gamma UCL	26179				
95% Adjusted Gamma UCL	26946				
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL		41127	
Result or 1/2 DL (lead)					
General Statistics					
Number of Valid Samples		18	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum	8.22	Minimum of Log Data		2.107	
Maximum	471	Maximum of Log Data		6.155	
Mean	57.7	Mean of log Data		3.182	
Median	17.1	SD of log Data		1.161	
SD	111.1				
Coefficient of Variation	1.926				
Skewness	3.403				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.491	Shapiro Wilk Test Statistic		0.821	
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value		0.897	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	103.3	95% H-UCL		107	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		105.1	
95% Adjusted-CLT UCL	123.2	97.5% Chebyshev (MVUE) UCL		131.2	
95% Modified-t UCL	106.8	99% Chebyshev (MVUE) UCL		182.5	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.615	Data do not follow a Discernable Distribution (0.05)			
Theta Star	93.85				
nu star	22.13				
Approximate Chi Square Value (.05)	12.44	Nonparametric Statistics			

Adjusted Level of Significance	0.0357	95% CLT UCL	100.8
Adjusted Chi Square Value	11.74	95% Jackknife UCL	103.3
		95% Standard Bootstrap UCL	99.39
Anderson-Darling Test Statistic	2.108	95% Bootstrap-t UCL	197
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	232.9
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	105.7
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	130.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	171.9
		97.5% Chebyshev(Mean, Sd) UCL	221.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	318.3
95% Approximate Gamma UCL	102.7		
95% Adjusted Gamma UCL	108.7		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	318.3

Result or 1/2 DL (lithium)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	2.59	Minimum of Log Data	0.952
Maximum	26.6	Maximum of Log Data	3.281
Mean	16.57	Mean of log Data	2.729
Median	16.15	SD of log Data	0.49
SD	5.136		
Coefficient of Variation	0.31		
Skewness	-0.697		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.671
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18.68	95% H-UCL	21.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.08
95% Adjusted-CLT UCL	18.35	97.5% Chebyshev (MVUE) UCL	29.95
95% Modified-t UCL	18.64	99% Chebyshev (MVUE) UCL	37.54
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.486	Data appear Normal at 5% Significance Level	
Theta Star	3.021		
nu star	197.5		
Approximate Chi Square Value (.05)	166	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	18.56
Adjusted Chi Square Value	163.2	95% Jackknife UCL	18.68
		95% Standard Bootstrap UCL	18.51
Anderson-Darling Test Statistic	1.234	95% Bootstrap-t UCL	18.55
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	18.52

Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	18.41
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	18.37
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.85
		97.5% Chebyshev(Mean, Sd) UCL	24.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.62
95% Approximate Gamma UCL	19.72		
95% Adjusted Gamma UCL	20.05		
Potential UCL to Use		Use 95% Student's-t UCL	18.68

Result or 1/2 DL (manganese)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	82.3	Minimum of Log Data	4.41
Maximum	1210	Maximum of Log Data	7.098
Mean	369.5	Mean of log Data	5.754
Median	296	SD of log Data	0.565
SD	247.7		
Coefficient of Variation	0.67		
Skewness	2.484		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.741	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	471	95% H-UCL	493.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	588.4
95% Adjusted-CLT UCL	502	97.5% Chebyshev (MVUE) UCL	684.4
95% Modified-t UCL	476.7	99% Chebyshev (MVUE) UCL	872.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.813	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	131.3		
nu star	101.3		
Approximate Chi Square Value (.05)	79.05	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	465.5
Adjusted Chi Square Value	77.16	95% Jackknife UCL	471
		95% Standard Bootstrap UCL	461.6
Anderson-Darling Test Statistic	0.663	95% Bootstrap-t UCL	536.8
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	887
Kolmogorov-Smirnov Test Statistic	0.172	95% Percentile Bootstrap UCL	465.4
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	499.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	623.9
		97.5% Chebyshev(Mean, Sd) UCL	734
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	950.3

95% Approximate Gamma UCL		473.3		
95% Adjusted Gamma UCL		484.9		
Potential UCL to Use			Use 95% Approximate Gamma UCL	473.3
Result or 1/2 DL (mercury)				
General Statistics				
Number of Valid Samples		18	Number of Unique Samples 15	
Raw Statistics			Log-transformed Statistics	
	Minimum	0.0011	Minimum of Log Data	-6.768
	Maximum	0.064	Maximum of Log Data	-2.749
	Mean	0.0126	Mean of log Data	-5.156
	Median	0.0074	SD of log Data	1.364
	SD	0.0163		
	Coefficient of Variation	1.295		
	Skewness	2.2		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
	Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.876
	Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
	95% Student's-t UCL	0.0193	95% H-UCL	0.0425
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.0351
	95% Adjusted-CLT UCL	0.0211	97.5% Chebyshev (MVUE) UCL	0.0445
	95% Modified-t UCL	0.0196	99% Chebyshev (MVUE) UCL	0.063
Gamma Distribution Test			Data Distribution	
	k star (bias corrected)	0.673	Data Follow Appr. Gamma Distribution at 5% Significance Level	
	Theta Star	0.0187		
	nu star	24.24		
	Approximate Chi Square Value (.05)	14.04	Nonparametric Statistics	
	Adjusted Level of Significance	0.0357	95% CLT UCL	0.0189
	Adjusted Chi Square Value	13.29	95% Jackknife UCL	0.0193
			95% Standard Bootstrap UCL	0.0187
	Anderson-Darling Test Statistic	0.775	95% Bootstrap-t UCL	0.0246
	Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	0.0464
	Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	0.0192
	Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.0209
Data follow Appr. Gamma Distribution at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0294
			97.5% Chebyshev(Mean, Sd) UCL	0.0366
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0509
	95% Approximate Gamma UCL	0.0218		
	95% Adjusted Gamma UCL	0.023		
Potential UCL to Use			Use 95% Approximate Gamma UCL	0.0218

Result or 1/2 DL (molybdenum)

General Statistics			
Number of Valid Samples		18	
			Number of Unique Samples
			15
Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	10.7	Maximum of Log Data	2.37
Mean	0.949	Mean of log Data	-1.744
Median	0.11	SD of log Data	1.698
SD	2.5		
Coefficient of Variation	2.636		
Skewness	3.897		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.406	Shapiro Wilk Test Statistic	0.851
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.974	95% H-UCL	3.547
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.934
95% Adjusted-CLT UCL	2.496	97.5% Chebyshev (MVUE) UCL	2.499
95% Modified-t UCL	2.064	99% Chebyshev (MVUE) UCL	3.609
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.363	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.616		
nu star	13.05		
Approximate Chi Square Value (.05)	5.929	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	1.918
Adjusted Chi Square Value	5.473	95% Jackknife UCL	1.974
		95% Standard Bootstrap UCL	1.909
Anderson-Darling Test Statistic	1.907	95% Bootstrap-t UCL	5.875
Anderson-Darling 5% Critical Value	0.823	95% Hall's Bootstrap UCL	5.186
Kolmogorov-Smirnov Test Statistic	0.276	95% Percentile Bootstrap UCL	2.078
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	2.807
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.517
		97.5% Chebyshev(Mean, Sd) UCL	4.629
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.812
95% Approximate Gamma UCL	2.088		
95% Adjusted Gamma UCL	2.262		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	6.812

Result or 1/2 DL (nickel)

General Statistics			
Number of Valid Samples		18	
			Number of Unique Samples
			17

Raw Statistics				Log-transformed Statistics			
	Minimum	11.7		Minimum of Log Data	2.46		
	Maximum	51.7		Maximum of Log Data	3.945		
	Mean	17.04		Mean of log Data	2.762		
	Median	14.6		SD of log Data	0.343		
	SD	9.054					
	Coefficient of Variation	0.531					
	Skewness	3.644					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.519		Shapiro Wilk Test Statistic	0.727		
	Shapiro Wilk Critical Value	0.897		Shapiro Wilk Critical Value	0.897		
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
	95% Student's-t UCL	20.76		95% H-UCL	19.67		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	22.75		
	95% Adjusted-CLT UCL	22.51		97.5% Chebyshev (MVUE) UCL	25.35		
	95% Modified-t UCL	21.06		99% Chebyshev (MVUE) UCL	30.46		
Gamma Distribution Test				Data Distribution			
	k star (bias corrected)	5.852		Data do not follow a Discernable Distribution (0.05)			
	Theta Star	2.912					
	nu star	210.7					
	Approximate Chi Square Value (.05)	178.1		Nonparametric Statistics			
	Adjusted Level of Significance	0.0357		95% CLT UCL	20.55		
	Adjusted Chi Square Value	175.2		95% Jackknife UCL	20.76		
				95% Standard Bootstrap UCL	20.4		
	Anderson-Darling Test Statistic	1.832		95% Bootstrap-t UCL	27.42		
	Anderson-Darling 5% Critical Value	0.741		95% Hall's Bootstrap UCL	33.85		
	Kolmogorov-Smirnov Test Statistic	0.262		95% Percentile Bootstrap UCL	20.86		
	Kolmogorov-Smirnov 5% Critical Value	0.204		95% BCA Bootstrap UCL	23.26		
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	26.35		
				97.5% Chebyshev(Mean, Sd) UCL	30.37		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	38.28		
	95% Approximate Gamma UCL	20.16					
	95% Adjusted Gamma UCL	20.49					
Potential UCL to Use				Use 95% Student's-t UCL	20.76		
				or 95% Modified-t UCL	21.06		

Result or 1/2 DL (phenanthrene)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.614
Maximum	1.34	Maximum of Log Data	0.293

Mean	0.109	Mean of log Data	-3.947
Median	0.0071	SD of log Data	1.591
SD	0.314		
Coefficient of Variation	2.872		
Skewness	3.979		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.37	Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.238	95% H-UCL	0.276
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.175
95% Adjusted-CLT UCL	0.305	97.5% Chebyshev (MVUE) UCL	0.225
95% Modified-t UCL	0.249	99% Chebyshev (MVUE) UCL	0.324
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.356	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.307		
nu star	12.81		
Approximate Chi Square Value (.05)	5.764	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.231
Adjusted Chi Square Value	5.316	95% Jackknife UCL	0.238
		95% Standard Bootstrap UCL	0.23
Anderson-Darling Test Statistic	2.6	95% Bootstrap-t UCL	0.851
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	0.793
Kolmogorov-Smirnov Test Statistic	0.318	95% Percentile Bootstrap UCL	0.249
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.341
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.431
		97.5% Chebyshev(Mean, Sd) UCL	0.571
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.845
95% Approximate Gamma UCL	0.243		
95% Adjusted Gamma UCL	0.263		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.845

Result or 1/2 DL (pyrene)

General Statistics

Number of Valid Samples	18	Number of Unique Samples	17
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Raw Statistics		Log-transformed Statistics	
Minimum	0.0061	Minimum of Log Data	-5.099
Maximum	1.87	Maximum of Log Data	0.626
Mean	0.147	Mean of log Data	-3.778
Median	0.0109	SD of log Data	1.68
SD	0.436		
Coefficient of Variation	2.972		
Skewness	4.066		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.357	Shapiro Wilk Test Statistic	0.795
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.325	95% H-UCL	0.436
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.244
95% Adjusted-CLT UCL	0.421	97.5% Chebyshev (MVUE) UCL	0.315
95% Modified-t UCL	0.342	99% Chebyshev (MVUE) UCL	0.455
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.337	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.435		
nu star	12.14		
Approximate Chi Square Value (.05)	5.319	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.316
Adjusted Chi Square Value	4.891	95% Jackknife UCL	0.325
		95% Standard Bootstrap UCL	0.317
Anderson-Darling Test Statistic	2.472	95% Bootstrap-t UCL	1.188
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	0.978
Kolmogorov-Smirnov Test Statistic	0.28	95% Percentile Bootstrap UCL	0.343
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.465
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.594
		97.5% Chebyshev(Mean, Sd) UCL	0.788
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.169
95% Approximate Gamma UCL	0.335		
95% Adjusted Gamma UCL	0.364		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.169

Result or 1/2 DL (silver)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0135	Minimum of Log Data	-4.305
Maximum	0.41	Maximum of Log Data	-0.892
Mean	0.0543	Mean of log Data	-3.38
Median	0.03	SD of log Data	0.781
SD	0.0909		
Coefficient of Variation	1.676		
Skewness	3.94		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.398	Shapiro Wilk Test Statistic	0.734
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897

Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0915	95% H-UCL	0.0721
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0843
95% Adjusted-CLT UCL	0.111	97.5% Chebyshev (MVUE) UCL	0.101
95% Modified-t UCL	0.0948	99% Chebyshev (MVUE) UCL	0.134
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.048	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0517		
nu star	37.74		
Approximate Chi Square Value (.05)	24.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	0.0895
Adjusted Chi Square Value	23.66	95% Jackknife UCL	0.0915
		95% Standard Bootstrap UCL	0.0886
Anderson-Darling Test Statistic	2.923	95% Bootstrap-t UCL	0.231
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	0.2
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	0.0964
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.148
		97.5% Chebyshev(Mean, Sd) UCL	0.188
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.267
95% Approximate Gamma UCL	0.083		
95% Adjusted Gamma UCL	0.0865		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.148

Result or 1/2 DL (strontium)

General Statistics			
Number of Valid Samples		18	
			Number of Unique Samples
			18
Raw Statistics		Log-transformed Statistics	
Minimum	26.6	Minimum of Log Data	3.281
Maximum	93.6	Maximum of Log Data	4.539
Mean	57.32	Mean of log Data	3.989
Median	52.85	SD of log Data	0.364
SD	19.7		
Coefficient of Variation	0.344		
Skewness	0.325		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic		Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value		Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		95% H-UCL	68.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.37

95% Adjusted-CLT UCL	65.34	97.5% Chebyshev (MVUE) UCL	88.84
95% Modified-t UCL	65.45	99% Chebyshev (MVUE) UCL	107.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.18	Data appear Normal at 5% Significance Level	
Theta Star	7.983		
nu star	258.5		
Approximate Chi Square Value (.05)	222.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	64.96
Adjusted Chi Square Value	219	95% Jackknife UCL	65.4
		95% Standard Bootstrap UCL	64.93
Anderson-Darling Test Statistic	0.455	95% Bootstrap-t UCL	66.2
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	65.45
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	64.92
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	64.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.56
		97.5% Chebyshev(Mean, Sd) UCL	86.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	103.5
95% Approximate Gamma UCL	66.66		
95% Adjusted Gamma UCL	67.64		
Potential UCL to Use		Use 95% Student's-t UCL	65.4

Result or 1/2 DL (thallium)

General Statistics			
Number of Valid Samples	18	Number of Unique Samples	12
Raw Statistics		Log-transformed Statistics	
Minimum	0.0455	Minimum of Log Data	-3.09
Maximum	0.63	Maximum of Log Data	-0.462
Mean	0.109	Mean of log Data	-2.67
Median	0.05	SD of log Data	0.771
SD	0.16		
Coefficient of Variation	1.47		
Skewness	2.87		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.56
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.174	95% H-UCL	0.144
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.169
95% Adjusted-CLT UCL	0.198	97.5% Chebyshev (MVUE) UCL	0.202
95% Modified-t UCL	0.178	99% Chebyshev (MVUE) UCL	0.268
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.078	Data do not follow a Discernable Distribution (0.05)	

Theta Star		0.101		
nu star		38.82		
Approximate Chi Square Value (.05)		25.55	Nonparametric Statistics	
Adjusted Level of Significance		0.0357	95% CLT UCL	0.171
Adjusted Chi Square Value		24.52	95% Jackknife UCL	0.174
			95% Standard Bootstrap UCL	0.168
Anderson-Darling Test Statistic		4.13	95% Bootstrap-t UCL	0.76
Anderson-Darling 5% Critical Value		0.761	95% Hall's Bootstrap UCL	0.596
Kolmogorov-Smirnov Test Statistic		0.397	95% Percentile Bootstrap UCL	0.167
Kolmogorov-Smirnov 5% Critical Value		0.208	95% BCA Bootstrap UCL	0.196
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.273
			97.5% Chebyshev(Mean, Sd) UCL	0.344
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.483
95% Approximate Gamma UCL		0.165		
95% Adjusted Gamma UCL		0.172		
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL	0.273
Result or 1/2 DL (tin)				
General Statistics				
Number of Valid Samples		18	Number of Unique Samples	14
Raw Statistics			Log-transformed Statistics	
Minimum		0.195	Minimum of Log Data	-1.635
Maximum		3.67	Maximum of Log Data	1.3
Mean		0.625	Mean of log Data	-0.897
Median		0.295	SD of log Data	0.805
SD		0.846		
Coefficient of Variation		1.354		
Skewness		3.137		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.533	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL		0.972	95% H-UCL	0.897
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	1.043
95% Adjusted-CLT UCL		1.111	97.5% Chebyshev (MVUE) UCL	1.256
95% Modified-t UCL		0.996	99% Chebyshev (MVUE) UCL	1.673
Gamma Distribution Test			Data Distribution	
k star (bias corrected)		1.131	Data do not follow a Discernable Distribution (0.05)	
Theta Star		0.552		
nu star		40.73		
Approximate Chi Square Value (.05)		27.1	Nonparametric Statistics	
Adjusted Level of Significance		0.0357	95% CLT UCL	0.953
Adjusted Chi Square Value		26.04	95% Jackknife UCL	0.972

						95% Standard Bootstrap UCL				0.958	
Anderson-Darling Test Statistic		2.399		95% Bootstrap-t UCL				1.597			
Anderson-Darling 5% Critical Value		0.76		95% Hall's Bootstrap UCL				2.128			
Kolmogorov-Smirnov Test Statistic		0.388		95% Percentile Bootstrap UCL				0.998			
Kolmogorov-Smirnov 5% Critical Value		0.208		95% BCA Bootstrap UCL				1.139			
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL				1.494			
				97.5% Chebyshev(Mean, Sd) UCL				1.87			
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL				2.609			
95% Approximate Gamma UCL		0.939									
95% Adjusted Gamma UCL		0.978									
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL				1.494			

Result or 1/2 DL (titanium)

General Statistics

Number of Valid Samples		18	Number of Unique Samples		17
Raw Statistics			Log-transformed Statistics		
Minimum		3.41	Minimum of Log Data		1.227
Maximum		55.9	Maximum of Log Data		4.024
Mean		20.67	Mean of log Data		2.882
Median		18.7	SD of log Data		0.591
SD		11.65			
Coefficient of Variation		0.563			
Skewness		1.656			

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.45	95% H-UCL	28.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.38
95% Adjusted-CLT UCL	26.33	97.5% Chebyshev (MVUE) UCL	40.17
95% Modified-t UCL	25.63	99% Chebyshev (MVUE) UCL	51.53

Gamma Distribution Test		Data Distribution
k star (bias corrected)	3.002	Data appear Gamma Distributed at 5% Significance Level
Theta Star	6.886	
nu star	108.1	

Approximate Chi Square Value (.05)	85.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	25.19
Adjusted Chi Square Value	83.12	95% Jackknife UCL	25.45
		95% Standard Bootstrap UCL	25.01
Anderson-Darling Test Statistic	0.339	95% Bootstrap-t UCL	27.18
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	31.11
Kolmogorov-Smirnov Test Statistic	0.11	95% Percentile Bootstrap UCL	25.41
Kolmogorov-Smirnov 5% Critical Value	0.205	95% BCA Bootstrap UCL	26.43

Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		32.64
				97.5% Chebyshev(Mean, Sd) UCL		37.82
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		47.99
95% Approximate Gamma UCL		26.26				
95% Adjusted Gamma UCL		26.88				
Potential UCL to Use				Use 95% Approximate Gamma UCL		26.26
Result or 1/2 DL (vanadium)						
General Statistics						
Number of Valid Samples		18	Number of Unique Samples		18	
Raw Statistics			Log-transformed Statistics			
Minimum		7.85	Minimum of Log Data		2.061	
Maximum		45.8	Maximum of Log Data		3.824	
Mean		19.66	Mean of log Data		2.884	
Median		18.65	SD of log Data		0.449	
SD		9.126				
Coefficient of Variation		0.464				
Skewness		1.322				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.905	Shapiro Wilk Test Statistic		0.981	
Shapiro Wilk Critical Value		0.897	Shapiro Wilk Critical Value		0.897	
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		23.4	95% H-UCL		24.54	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		28.98	
95% Adjusted-CLT UCL		23.91	97.5% Chebyshev (MVUE) UCL		33.02	
95% Modified-t UCL		23.51	99% Chebyshev (MVUE) UCL		40.95	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		4.562	Data appear Normal at 5% Significance Level			
Theta Star		4.309				
nu star		164.2				
Approximate Chi Square Value (.05)		135.6	Nonparametric Statistics			
Adjusted Level of Significance		0.0357	95% CLT UCL		23.2	
Adjusted Chi Square Value		133.1	95% Jackknife UCL		23.4	
			95% Standard Bootstrap UCL		23.08	
Anderson-Darling Test Statistic		0.2	95% Bootstrap-t UCL		24.27	
Anderson-Darling 5% Critical Value		0.743	95% Hall's Bootstrap UCL		25.56	
Kolmogorov-Smirnov Test Statistic		0.0982	95% Percentile Bootstrap UCL		23.38	
Kolmogorov-Smirnov 5% Critical Value		0.204	95% BCA Bootstrap UCL		23.66	
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		29.03	
			97.5% Chebyshev(Mean, Sd) UCL		33.09	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		41.06	
95% Approximate Gamma UCL		23.81				
95% Adjusted Gamma UCL		24.26				

Potential UCL to Use						Use 95% Student's-t UCL				23.4	
Result or 1/2 DL (zinc)											
General Statistics											
Number of Valid Samples				18		Number of Unique Samples				18	
Raw Statistics						Log-transformed Statistics					
Minimum				29.5		Minimum of Log Data				3.384	
Maximum				5640		Maximum of Log Data				8.638	
Mean				418.4		Mean of log Data				4.562	
Median				53.95		SD of log Data				1.321	
SD				1308							
Coefficient of Variation				3.125							
Skewness				4.195							
Relevant UCL Statistics											
Normal Distribution Test						Lognormal Distribution Test					
Shapiro Wilk Test Statistic				0.313		Shapiro Wilk Test Statistic				0.791	
Shapiro Wilk Critical Value				0.897		Shapiro Wilk Critical Value				0.897	
Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level					
Assuming Normal Distribution						Assuming Lognormal Distribution					
95% Student's-t UCL				954.5		95% H-UCL				630.3	
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL				542.9	
95% Adjusted-CLT UCL				1251		97.5% Chebyshev (MVUE) UCL				686.4	
95% Modified-t UCL				1005		99% Chebyshev (MVUE) UCL				968.2	
Gamma Distribution Test						Data Distribution					
k star (bias corrected)				0.403		Data do not follow a Discernable Distribution (0.05)					
Theta Star				1037							
nu star				14.52							
Approximate Chi Square Value (.05)				6.931		Nonparametric Statistics					
Adjusted Level of Significance				0.0357		95% CLT UCL				925.3	
Adjusted Chi Square Value				6.432		95% Jackknife UCL				954.5	
						95% Standard Bootstrap UCL				894.1	
Anderson-Darling Test Statistic				2.911		95% Bootstrap-t UCL				5665	
Anderson-Darling 5% Critical Value				0.813		95% Hall's Bootstrap UCL				3753	
Kolmogorov-Smirnov Test Statistic				0.278		95% Percentile Bootstrap UCL				1025	
Kolmogorov-Smirnov 5% Critical Value				0.217		95% BCA Bootstrap UCL				1352	
Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL				1762	
						97.5% Chebyshev(Mean, Sd) UCL				2343	
Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL				3485	
95% Approximate Gamma UCL				876.6							
95% Adjusted Gamma UCL				944.6							
Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL				3485	

APPENDIX A-4

NORTH OF MARLIN SOIL

				General UCL Statistics for Full Data Sets							
User Selected Options											
From File				J:\1352 - Gulfco RI\risk\eco\Tables for Revisited SLERA\soil N of Marlin aug 2008.wst							
Full Precision				OFF							
Confidence Coefficient				95%							
Number of Bootstrap Operations				2000							
Result or 1/2 DL (1,1-dichloroethane)											
General Statistics											
Number of Valid Samples				19		Number of Unique Samples				19	
Raw Statistics				Log-transformed Statistics							
		Minimum	6.4000E-5			Minimum of Log Data		-9.657			
		Maximum	0.518			Maximum of Log Data		-0.658			
		Mean	0.0286			Mean of log Data		-7.963			
		Median	8.7000E-5			SD of log Data		2.504			
		SD	0.119								
		Coefficient of Variation	4.147								
		Skewness	4.355								
Relevant UCL Statistics											
Normal Distribution Test				Lognormal Distribution Test							
		Shapiro Wilk Test Statistic	0.258			Shapiro Wilk Test Statistic		0.689			
		Shapiro Wilk Critical Value	0.901			Shapiro Wilk Critical Value		0.901			
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level							
Assuming Normal Distribution				Assuming Lognormal Distribution							
		95% Student's-t UCL	0.0757			95% H-UCL		0.172			
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		0.0196			
		95% Adjusted-CLT UCL	0.102			97.5% Chebyshev (MVUE) UCL		0.026			
		95% Modified-t UCL	0.0803			99% Chebyshev (MVUE) UCL		0.0385			
Gamma Distribution Test				Data Distribution							
		k star (bias corrected)	0.179			Data do not follow a Discernable Distribution (0.05)					
		Theta Star	0.16								
		nu star	6.805								
		Approximate Chi Square Value (.05)	2.064			Nonparametric Statistics					
		Adjusted Level of Significance	0.0369			95% CLT UCL		0.0733			
		Adjusted Chi Square Value	1.844			95% Jackknife UCL		0.0757			
						95% Standard Bootstrap UCL		0.0709			
		Anderson-Darling Test Statistic	4.123			95% Bootstrap-t UCL		2.611			
		Anderson-Darling 5% Critical Value	0.899			95% Hall's Bootstrap UCL		1.441			
		Kolmogorov-Smirnov Test Statistic	0.386			95% Percentile Bootstrap UCL		0.0826			
		Kolmogorov-Smirnov 5% Critical Value	0.221			95% BCA Bootstrap UCL		0.111			
Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		0.147			
						97.5% Chebyshev(Mean, Sd) UCL		0.198			
Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		0.299			
		95% Approximate Gamma UCL	0.0942								
		95% Adjusted Gamma UCL	0.105								

Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.299
Result or 1/2 DL (1,1-dichloroethene)						
General Statistics						
Number of Valid Samples			19	Number of Unique Samples		19
Raw Statistics			Log-transformed Statistics			
	Minimum	1.4500E-4		Minimum of Log Data	-8.839	
	Maximum	0.313		Maximum of Log Data	-1.162	
	Mean	0.0179		Mean of log Data	-7.528	
	Median	1.9050E-4		SD of log Data	2.12	
	SD	0.0715				
	Coefficient of Variation	3.989				
	Skewness	4.348				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.267		Shapiro Wilk Test Statistic	0.64	
	Shapiro Wilk Critical Value	0.901		Shapiro Wilk Critical Value	0.901	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
	95% Student's-t UCL	0.0464		95% H-UCL	0.0481	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0135	
	95% Adjusted-CLT UCL	0.0624		97.5% Chebyshev (MVUE) UCL	0.0177	
	95% Modified-t UCL	0.0491		99% Chebyshev (MVUE) UCL	0.026	
Gamma Distribution Test			Data Distribution			
	k star (bias corrected)	0.211	Data do not follow a Discernable Distribution (0.05)			
	Theta Star	0.0851				
	nu star	8.005				
	Approximate Chi Square Value (.05)	2.738	Nonparametric Statistics			
	Adjusted Level of Significance	0.0369		95% CLT UCL	0.0449	
	Adjusted Chi Square Value	2.476		95% Jackknife UCL	0.0464	
				95% Standard Bootstrap UCL	0.0439	
	Anderson-Darling Test Statistic	4.354		95% Bootstrap-t UCL	0.671	
	Anderson-Darling 5% Critical Value	0.884		95% Hall's Bootstrap UCL	0.399	
	Kolmogorov-Smirnov Test Statistic	0.427		95% Percentile Bootstrap UCL	0.0504	
	Kolmogorov-Smirnov 5% Critical Value	0.219		95% BCA Bootstrap UCL	0.0673	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0894	
				97.5% Chebyshev(Mean, Sd) UCL	0.12	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.181	
	95% Approximate Gamma UCL	0.0524				
	95% Adjusted Gamma UCL	0.058				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.181	
Result or 1/2 DL (1,2-dichloroethane)						

General Statistics						
Number of Valid Samples		19	Number of Unique Samples		18	
Raw Statistics			Log-transformed Statistics			
	Minimum	4.6000E-5		Minimum of Log Data	-9.987	
	Maximum	0.177		Maximum of Log Data	-1.732	
	Mean	0.0106		Mean of log Data	-8.083	
	Median	6.2500E-5		SD of log Data	2.49	
	SD	0.0404				
	Coefficient of Variation	3.799				
	Skewness	4.329				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.282		Shapiro Wilk Test Statistic	0.741	
	Shapiro Wilk Critical Value	0.901		Shapiro Wilk Critical Value	0.901	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
	95% Student's-t UCL	0.0267		95% H-UCL	0.143	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0169	
	95% Adjusted-CLT UCL	0.0357		97.5% Chebyshev (MVUE) UCL	0.0223	
	95% Modified-t UCL	0.0282		99% Chebyshev (MVUE) UCL	0.0331	
Gamma Distribution Test			Data Distribution			
	k star (bias corrected)	0.209	Data do not follow a Discernable Distribution (0.05)			
	Theta Star	0.0508				
	nu star	7.952				
Approximate Chi Square Value (.05)			Nonparametric Statistics			
	Adjusted Level of Significance	0.0369		95% CLT UCL	0.0259	
	Adjusted Chi Square Value	2.447		95% Jackknife UCL	0.0267	
				95% Standard Bootstrap UCL	0.0255	
	Anderson-Darling Test Statistic	3.162		95% Bootstrap-t UCL	0.349	
	Anderson-Darling 5% Critical Value	0.885		95% Hall's Bootstrap UCL	0.153	
	Kolmogorov-Smirnov Test Statistic	0.358		95% Percentile Bootstrap UCL	0.0291	
	Kolmogorov-Smirnov 5% Critical Value	0.22		95% BCA Bootstrap UCL	0.0389	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.051	
				97.5% Chebyshev(Mean, Sd) UCL	0.0685	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.103	
	95% Approximate Gamma UCL	0.0312				
	95% Adjusted Gamma UCL	0.0345				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL			0.103

Result or 1/2 DL (2-butanone)

General Statistics					
Number of Valid Samples		19	Number of Unique Samples		19
Raw Statistics			Log-transformed Statistics		
Minimum		1.2600E-4	Minimum of Log Data		-8.979

Maximum	0.208	Maximum of Log Data	-1.57
Mean	0.0139	Mean of log Data	-6.223
Median	0.0029	SD of log Data	1.907
SD	0.0471		
Coefficient of Variation	3.378		
Skewness	4.338		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.288	Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0327	95% H-UCL	0.0777
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0326
95% Adjusted-CLT UCL	0.0432	97.5% Chebyshev (MVUE) UCL	0.0424
95% Modified-t UCL	0.0344	99% Chebyshev (MVUE) UCL	0.0618
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.326	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0427		
nu star	12.4		
Approximate Chi Square Value (.05)	5.488	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0317
Adjusted Chi Square Value	5.091	95% Jackknife UCL	0.0327
		95% Standard Bootstrap UCL	0.0315
Anderson-Darling Test Statistic	2.196	95% Bootstrap-t UCL	0.25
Anderson-Darling 5% Critical Value	0.834	95% Hall's Bootstrap UCL	0.129
Kolmogorov-Smirnov Test Statistic	0.356	95% Percentile Bootstrap UCL	0.0353
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.0466
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.061
		97.5% Chebyshev(Mean, Sd) UCL	0.0814
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.121
95% Approximate Gamma UCL	0.0315		
95% Adjusted Gamma UCL	0.0339		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.121

Result or 1/2 DL (2-methylnaphthalene)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.053	Maximum of Log Data	-2.937
Mean	0.0103	Mean of log Data	-4.915
Median	0.0059	SD of log Data	0.663
SD	0.0131		
Coefficient of Variation	1.267		

Skewness		2.781	
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.416	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.014	95% H-UCL	0.0115
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0138
95% Adjusted-CLT UCL	0.015	97.5% Chebyshev (MVUE) UCL	0.0158
95% Modified-t UCL	0.0142	99% Chebyshev (MVUE) UCL	0.0198
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.491	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0069		
nu star	107.3		
Approximate Chi Square Value (.05)	84.44	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0139
Adjusted Chi Square Value	83.51	95% Jackknife UCL	0.014
		95% Standard Bootstrap UCL	0.0138
Anderson-Darling Test Statistic	9.26	95% Bootstrap-t UCL	0.0166
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	0.0135
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	0.0141
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.0152
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0198
		97.5% Chebyshev(Mean, Sd) UCL	0.024
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.032
95% Approximate Gamma UCL	0.0131		
95% Adjusted Gamma UCL	0.0133		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0198

Result or 1/2 DL (4,4'-dde)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	31
Raw Statistics		Log-transformed Statistics	
Minimum	1.8950E-4	Minimum of Log Data	-8.571
Maximum	0.0149	Maximum of Log Data	-4.206
Mean	7.0636E-4	Mean of log Data	-8.216
Median	2.1150E-4	SD of log Data	0.842
SD	0.0024		
Coefficient of Variation	3.483		
Skewness	5.808		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.222	Shapiro Wilk Test Statistic	0.415

Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.0014		95% H-UCL	5.2862E-4	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	6.4086E-4	
95% Adjusted-CLT UCL	0.0018		97.5% Chebyshev (MVUE) UCL	7.5362E-4	
95% Modified-t UCL	0.0014		99% Chebyshev (MVUE) UCL	9.7511E-4	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.603		Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0011				
nu star	43.4				
Approximate Chi Square Value (.05)	29.29		Nonparametric Statistics		
Adjusted Level of Significance	0.0428		95% CLT UCL	0.0013	
Adjusted Chi Square Value	28.77		95% Jackknife UCL	0.0014	
			95% Standard Bootstrap UCL	0.0013	
Anderson-Darling Test Statistic	10.81		95% Bootstrap-t UCL	0.0475	
Anderson-Darling 5% Critical Value	0.799		95% Hall's Bootstrap UCL	0.0081	
Kolmogorov-Smirnov Test Statistic	0.505		95% Percentile Bootstrap UCL	0.0015	
Kolmogorov-Smirnov 5% Critical Value	0.154		95% BCA Bootstrap UCL	0.0020	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0024	
			97.5% Chebyshev(Mean, Sd) UCL	0.0032	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0047	
95% Approximate Gamma UCL	0.0010				
95% Adjusted Gamma UCL	0.0010				
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL	0.0024	
Result or 1/2 DL (4,4'-ddt)					
General Statistics					
Number of Valid Samples	36		Number of Unique Samples	28	
Raw Statistics			Log-transformed Statistics		
Minimum	7.3000E-5		Minimum of Log Data	-9.525	
Maximum	0.0108		Maximum of Log Data	-4.528	
Mean	7.0422E-4		Mean of log Data	-8.523	
Median	8.3500E-5		SD of log Data	1.323	
SD	0.0019				
Coefficient of Variation	2.703				
Skewness	4.722				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.372		Shapiro Wilk Test Statistic	0.755	
Shapiro Wilk Critical Value	0.935		Shapiro Wilk Critical Value	0.935	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.0012		95% H-UCL	8.9022E-4	

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.001
95% Adjusted-CLT UCL	0.0014	97.5% Chebyshev (MVUE) UCL		0.0012
95% Modified-t UCL	0.0012	99% Chebyshev (MVUE) UCL		0.0017
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.479	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0014			
nu star	34.46			
Approximate Chi Square Value (.05)	22.04	Nonparametric Statistics		
Adjusted Level of Significance	0.0428	95% CLT UCL		0.0012
Adjusted Chi Square Value	21.58	95% Jackknife UCL		0.0012
		95% Standard Bootstrap UCL		0.0012
Anderson-Darling Test Statistic	4.944	95% Bootstrap-t UCL		0.0028
Anderson-Darling 5% Critical Value	0.812	95% Hall's Bootstrap UCL		0.0032
Kolmogorov-Smirnov Test Statistic	0.31	95% Percentile Bootstrap UCL		0.0012
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL		0.0016
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0020
		97.5% Chebyshev(Mean, Sd) UCL		0.0026
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.0038
95% Approximate Gamma UCL	0.0011			
95% Adjusted Gamma UCL	0.0011			
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL		0.0038

Result or 1/2 DL (acenaphthene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	0.0049	Minimum of Log Data	-5.3
Maximum	0.157	Maximum of Log Data	-1.852
Mean	0.0142	Mean of log Data	-4.898
Median	0.0055	SD of log Data	0.825
SD	0.03		
Coefficient of Variation	2.115		
Skewness	4.095		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.345	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0227	95% H-UCL	0.0143
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0173
95% Adjusted-CLT UCL	0.0261	97.5% Chebyshev (MVUE) UCL	0.0203
95% Modified-t UCL	0.0232	99% Chebyshev (MVUE) UCL	0.0262
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.85	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0167		
nu star	61.21		
Approximate Chi Square Value (.05)	44.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0224
Adjusted Chi Square Value	43.56	95% Jackknife UCL	0.0227
		95% Standard Bootstrap UCL	0.0222
Anderson-Darling Test Statistic	9.363	95% Bootstrap-t UCL	0.0524
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.0561
Kolmogorov-Smirnov Test Statistic	0.497	95% Percentile Bootstrap UCL	0.0229
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	0.0271
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.036
		97.5% Chebyshev(Mean, Sd) UCL	0.0455
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.064
95% Approximate Gamma UCL	0.0197		
95% Adjusted Gamma UCL	0.02		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.036

Result or 1/2 DL (aluminum)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	32
Raw Statistics		Log-transformed Statistics	
Minimum	1810	Minimum of Log Data	7.501
Maximum	18300	Maximum of Log Data	9.815
Mean	11971	Mean of log Data	9.317
Median	11700	SD of log Data	0.437
SD	3979		
Coefficient of Variation	0.332		
Skewness	-0.25		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.962	Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13092	95% H-UCL	14053
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16219
95% Adjusted-CLT UCL	13032	97.5% Chebyshev (MVUE) UCL	17956
95% Modified-t UCL	13087	99% Chebyshev (MVUE) UCL	21367
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.424	Data appear Normal at 5% Significance Level	
Theta Star	1863		
nu star	462.6		
Approximate Chi Square Value (.05)	413.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	13062

Adjusted Chi Square Value	411.6	95% Jackknife UCL	13092
		95% Standard Bootstrap UCL	13034
Anderson-Darling Test Statistic	0.592	95% Bootstrap-t UCL	13062
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	13058
Kolmogorov-Smirnov Test Statistic	0.0919	95% Percentile Bootstrap UCL	13052
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	13052
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14862
		97.5% Chebyshev(Mean, Sd) UCL	16113
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18569
95% Approximate Gamma UCL	13385		
95% Adjusted Gamma UCL	13453		
Potential UCL to Use		Use 95% Student's-t UCL	13092

Result or 1/2 DL (anthracene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	24
Raw Statistics		Log-transformed Statistics	
Minimum	0.0037	Minimum of Log Data	-5.594
Maximum	-0.264	Maximum of Log Data	-1.332
Mean	0.0215	Mean of log Data	-4.761
Median	0.006	SD of log Data	1.024
SD	0.0516		
Coefficient of Variation	2.397		
Skewness	4.003		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.372	Shapiro Wilk Test Statistic	0.624
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0361	95% H-UCL	0.022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0264
95% Adjusted-CLT UCL	0.0418	97.5% Chebyshev (MVUE) UCL	0.0317
95% Modified-t UCL	0.037	99% Chebyshev (MVUE) UCL	0.0422
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.623	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0346		
nu star	44.87		
Approximate Chi Square Value (.05)	30.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0357
Adjusted Chi Square Value	29.96	95% Jackknife UCL	0.0361
		95% Standard Bootstrap UCL	0.0361
Anderson-Darling Test Statistic	7.709	95% Bootstrap-t UCL	0.0846
Anderson-Darling 5% Critical Value	0.797	95% Hall's Bootstrap UCL	0.0941
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	0.037

Kolmogorov-Smirnov 5% Critical Value		0.154	95% BCA Bootstrap UCL		0.0437
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0591
			97.5% Chebyshev(Mean, Sd) UCL		0.0753
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.107
95% Approximate Gamma UCL		0.0317			
95% Adjusted Gamma UCL		0.0323			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.107
Result or 1/2 DL (antimony)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		23
Raw Statistics			Log-transformed Statistics		
Minimum		0.095	Minimum of Log Data		-2.354
Maximum		8.09	Maximum of Log Data		2.091
Mean		1.416	Mean of log Data		-0.752
Median		0.125	SD of log Data		1.642
SD		1.779			
Coefficient of Variation		1.256			
Skewness		1.716			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.738	Shapiro Wilk Test Statistic		0.731
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		1.917	95% H-UCL		4.438
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		4.311
95% Adjusted-CLT UCL		1.994	97.5% Chebyshev (MVUE) UCL		5.452
95% Modified-t UCL		1.931	99% Chebyshev (MVUE) UCL		7.692
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.538	Data do not follow a Discernable Distribution (0.05)		
Theta Star		2.632			
nu star		38.74			
Approximate Chi Square Value (.05)		25.48	Nonparametric Statistics		
Adjusted Level of Significance		0.0428	95% CLT UCL		1.904
Adjusted Chi Square Value		25	95% Jackknife UCL		1.917
			95% Standard Bootstrap UCL		1.915
Anderson-Darling Test Statistic		4.128	95% Bootstrap-t UCL		2.065
Anderson-Darling 5% Critical Value		0.806	95% Hall's Bootstrap UCL		2.167
Kolmogorov-Smirnov Test Statistic		0.349	95% Percentile Bootstrap UCL		1.93
Kolmogorov-Smirnov 5% Critical Value		0.155	95% BCA Bootstrap UCL		2.035
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		2.708
			97.5% Chebyshev(Mean, Sd) UCL		3.267
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		4.366
95% Approximate Gamma UCL		2.152			

95% Adjusted Gamma UCL		2.195			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		4.366
Result or 1/2 DL (aroclor-1254)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		34
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0019		Minimum of Log Data	-6.269
	Maximum	0.0938		Maximum of Log Data	-2.367
	Mean	0.0056		Mean of log Data	-5.848
	Median	0.0021		SD of log Data	0.763
	SD	0.0154			
	Coefficient of Variation	2.735			
	Skewness	5.714			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.254		Shapiro Wilk Test Statistic	0.554
	Shapiro Wilk Critical Value	0.935		Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.0099		95% H-UCL	0.0050
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0061
	95% Adjusted-CLT UCL	0.0124		97.5% Chebyshev (MVUE) UCL	0.0071
	95% Modified-t UCL	0.0104		99% Chebyshev (MVUE) UCL	0.0091
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.826	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.0068			
	nu star	59.44			
	Approximate Chi Square Value (.05)	42.71	Nonparametric Statistics		
	Adjusted Level of Significance	0.0428		95% CLT UCL	0.0098
	Adjusted Chi Square Value	42.07		95% Jackknife UCL	0.0099
				95% Standard Bootstrap UCL	0.0097
	Anderson-Darling Test Statistic	8.285		95% Bootstrap-t UCL	0.0476
	Anderson-Darling 5% Critical Value	0.782		95% Hall's Bootstrap UCL	0.0303
	Kolmogorov-Smirnov Test Statistic	0.394		95% Percentile Bootstrap UCL	0.0107
	Kolmogorov-Smirnov 5% Critical Value	0.152		95% BCA Bootstrap UCL	0.0152
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0168
				97.5% Chebyshev(Mean, Sd) UCL	0.0216
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.0311
	95% Approximate Gamma UCL	0.0078			
	95% Adjusted Gamma UCL	0.0079			
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL	0.0168

Result or 1/2 DL (arsenic)

General Statistics			
Number of Valid Samples		36	
Number of Unique Samples			32
Raw Statistics		Log-transformed Statistics	
Minimum	0.105	Minimum of Log Data	-2.254
Maximum	5.69	Maximum of Log Data	1.739
Mean	2.573	Mean of log Data	0.673
Median	2.53	SD of log Data	0.969
SD	1.369		
Coefficient of Variation	0.532		
Skewness	0.256		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.732
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.959	95% H-UCL	4.613
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.572
95% Adjusted-CLT UCL	2.959	97.5% Chebyshev (MVUE) UCL	6.652
95% Modified-t UCL	2.96	99% Chebyshev (MVUE) UCL	8.772
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.84	Data appear Normal at 5% Significance Level	
Theta Star	1.399		
nu star	132.5		
Approximate Chi Square Value (.05)	106.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	2.948
Adjusted Chi Square Value	105.8	95% Jackknife UCL	2.959
		95% Standard Bootstrap UCL	2.934
Anderson-Darling Test Statistic	2.399	95% Bootstrap-t UCL	2.955
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	2.96
Kolmogorov-Smirnov Test Statistic	0.231	95% Percentile Bootstrap UCL	2.938
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	2.961
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.567
		97.5% Chebyshev(Mean, Sd) UCL	3.998
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.843
95% Approximate Gamma UCL	3.189		
95% Adjusted Gamma UCL	3.221		
Potential UCL to Use		Use 95% Student's-t UCL	2.959

Result or 1/2 DL (barium)

General Statistics			
Number of Valid Samples		36	
Number of Unique Samples			31

Raw Statistics			Log-transformed Statistics		
	Minimum	46.1		Minimum of Log Data	3.831
	Maximum	476		Maximum of Log Data	6.165
	Mean	142.1		Mean of log Data	4.802
	Median	121		SD of log Data	0.53
	SD	95.9			
	Coefficient of Variation	0.675			
	Skewness	2.311			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.718		Shapiro Wilk Test Statistic	0.934
	Shapiro Wilk Critical Value	0.935		Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	169.1		95% H-UCL	166.7
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	196.1
	95% Adjusted-CLT UCL	174.9		97.5% Chebyshev (MVUE) UCL	220.5
	95% Modified-t UCL	170.1		99% Chebyshev (MVUE) UCL	268.6
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	3.139	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	45.26			
	nu star	226			
	Approximate Chi Square Value (.05)	192.2	Nonparametric Statistics		
	Adjusted Level of Significance	0.0428		95% CLT UCL	168.4
	Adjusted Chi Square Value	190.8		95% Jackknife UCL	169.1
				95% Standard Bootstrap UCL	168
	Anderson-Darling Test Statistic	1.456		95% Bootstrap-t UCL	180.8
	Anderson-Darling 5% Critical Value	0.753		95% Hall's Bootstrap UCL	182.1
	Kolmogorov-Smirnov Test Statistic	0.199		95% Percentile Bootstrap UCL	168.2
	Kolmogorov-Smirnov 5% Critical Value	0.148		95% BCA Bootstrap UCL	175.1
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	211.7
				97.5% Chebyshev(Mean, Sd) UCL	241.9
				99% Chebyshev(Mean, Sd) UCL	301.1
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	167.1			
	95% Adjusted Gamma UCL	168.3			
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL	211.7

Result or 1/2 DL (benzo(a)anthracene)

General Statistics					
	Number of Valid Samples	36		Number of Unique Samples	25
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0025		Minimum of Log Data	-5.985
	Maximum	1.18		Maximum of Log Data	0.166
	Mean	0.068		Mean of log Data	-4.862
	Median	0.0055		SD of log Data	1.45

SD		0.239		
Coefficient of Variation		3.512		
Skewness		4.117		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.304	Shapiro Wilk Test Statistic 0.587	
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value 0.935	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL		0.135	95% H-UCL 0.0457	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL 0.049	
95% Adjusted-CLT UCL		0.163	97.5% Chebyshev (MVUE) UCL 0.0612	
95% Modified-t UCL		0.14	99% Chebyshev (MVUE) UCL 0.085	
Gamma Distribution Test			Data Distribution	
k star (bias corrected)		0.307	Data do not follow a Discernable Distribution (0.05)	
Theta Star		0.222		
nu star		22.1		
Approximate Chi Square Value (.05)		12.41	Nonparametric Statistics	
Adjusted Level of Significance		0.0428	95% CLT UCL 0.134	
Adjusted Chi Square Value		12.08	95% Jackknife UCL 0.135	
			95% Standard Bootstrap UCL 0.133	
Anderson-Darling Test Statistic		9.41	95% Bootstrap-t UCL 0.491	
Anderson-Darling 5% Critical Value		0.853	95% Hall's Bootstrap UCL 0.61	
Kolmogorov-Smirnov Test Statistic		0.502	95% Percentile Bootstrap UCL 0.137	
Kolmogorov-Smirnov 5% Critical Value		0.159	95% BCA Bootstrap UCL 0.176	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL 0.242	
			97.5% Chebyshev(Mean, Sd) UCL 0.317	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL 0.464	
95% Approximate Gamma UCL		0.121		
95% Adjusted Gamma UCL		0.124		
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL 0.464	
Result or 1/2 DL (benzo(a)pyrene)				
General Statistics				
Number of Valid Samples		36	Number of Unique Samples 28	
Raw Statistics			Log-transformed Statistics	
Minimum		0.0045	Minimum of Log Data -5.403	
Maximum		1.42	Maximum of Log Data 0.351	
Mean		0.0922	Mean of log Data -4.333	
Median		0.0056	SD of log Data 1.62	
SD		0.278		
Coefficient of Variation		3.017		
Skewness		4.117		
Relevant UCL Statistics				

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.361		Shapiro Wilk Test Statistic		0.651	
Shapiro Wilk Critical Value		0.935		Shapiro Wilk Critical Value		0.935	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.171		95% H-UCL		0.117	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.115	
95% Adjusted-CLT UCL		0.203		97.5% Chebyshev (MVUE) UCL		0.145	
95% Modified-t UCL		0.176		99% Chebyshev (MVUE) UCL		0.205	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.335		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.275					
nu star		24.15					
Approximate Chi Square Value (.05)		13.96		Nonparametric Statistics			
Adjusted Level of Significance		0.0428		95% CLT UCL		0.169	
Adjusted Chi Square Value		13.61		95% Jackknife UCL		0.171	
				95% Standard Bootstrap UCL		0.168	
Anderson-Darling Test Statistic		6.99		95% Bootstrap-t UCL		0.5	
Anderson-Darling 5% Critical Value		0.847		95% Hall's Bootstrap UCL		0.495	
Kolmogorov-Smirnov Test Statistic		0.422		95% Percentile Bootstrap UCL		0.175	
Kolmogorov-Smirnov 5% Critical Value		0.158		95% BCA Bootstrap UCL		0.217	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.294	
				97.5% Chebyshev(Mean, Sd) UCL		0.382	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.554	
95% Approximate Gamma UCL		0.16					
95% Adjusted Gamma UCL		0.164					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.554	

Result or 1/2 DL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples		36	
Number of Unique Samples			32
Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.625
Maximum	1.62	Maximum of Log Data	0.482
Mean	0.12	Mean of log Data	-4.074
Median	0.0062	SD of log Data	1.886
SD	0.319		
Coefficient of Variation	2.649		
Skewness	3.981		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.412	
Shapiro Wilk Critical Value		0.935	
Data not Normal at 5% Significance Level			
Data not Lognormal at 5% Significance Level			

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.21	95% H-UCL	0.315
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.257
95% Adjusted-CLT UCL	0.245	97.5% Chebyshev (MVUE) UCL	0.329
95% Modified-t UCL	0.216	99% Chebyshev (MVUE) UCL	0.471
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.36		
nu star	24.08		
Approximate Chi Square Value (.05)	13.91	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.208
Adjusted Chi Square Value	13.56	95% Jackknife UCL	0.21
		95% Standard Bootstrap UCL	0.207
Anderson-Darling Test Statistic	4.213	95% Bootstrap-t UCL	0.469
Anderson-Darling 5% Critical Value	0.847	95% Hall's Bootstrap UCL	0.615
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	0.214
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.267
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.352
		97.5% Chebyshev(Mean, Sd) UCL	0.452
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.649
95% Approximate Gamma UCL	0.208		
95% Adjusted Gamma UCL	0.214		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.649

General Statistics

Raw Statistics			Log-transformed Statistics	
Minimum	0.0046		Minimum of Log Data	-5.368
Maximum	1.28		Maximum of Log Data	0.247
Mean	0.0961		Mean of log Data	-4.016
Median	0.0058		SD of log Data	1.685
SD	0.24			
Coefficient of Variation	2.497			
Skewness	4.019			

Normal Distribution Test

Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.756
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935

Assuming Normal Distribution

95% Student's-t UCL	0.164	95% H-UCL	0.19
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.18
95% Adjusted-CLT UCL	0.191	97.5% Chebyshev (MVUE) UCL	0.228
95% Modified-t UCL	0.168	99% Chebyshev (MVUE) UCL	0.323

Gamma Distribution Test				Data Distribution	
k star (bias corrected)	0.38	Data do not follow a Discernable Distribution (0.05)			
Theta Star	0.253				
nu star	27.35				
Approximate Chi Square Value (.05)	16.42	Nonparametric Statistics			
Adjusted Level of Significance	0.0428	95% CLT UCL		0.162	
Adjusted Chi Square Value	16.03	95% Jackknife UCL		0.164	
		95% Standard Bootstrap UCL		0.162	
Anderson-Darling Test Statistic	4.565	95% Bootstrap-t UCL		0.284	
Anderson-Darling 5% Critical Value	0.836	95% Hall's Bootstrap UCL		0.403	
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL		0.173	
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL		0.206	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.27	
		97.5% Chebyshev(Mean, Sd) UCL		0.346	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.494	
95% Approximate Gamma UCL	0.16				
95% Adjusted Gamma UCL	0.164				
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL		0.494	

Result or 1/2 DL (benzo(k)fluoranthene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	25
Raw Statistics		Log-transformed Statistics	
Minimum	0.0055	Minimum of Log Data	-5.203
Maximum	0.799	Maximum of Log Data	-0.224
Mean	0.0601	Mean of log Data	-4.26
Median	0.0085	SD of log Data	1.298
SD	0.169		
Coefficient of Variation	2.819		
Skewness	3.875		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.357	Shapiro Wilk Test Statistic	0.62
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.108	95% H-UCL	0.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0682
95% Adjusted-CLT UCL	0.126	97.5% Chebyshev (MVUE) UCL	0.0841
95% Modified-t UCL	0.111	99% Chebyshev (MVUE) UCL	0.115
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.428	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.141		
nu star	30.79		

Approximate Chi Square Value (.05)	19.12	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.107
Adjusted Chi Square Value	18.7	95% Jackknife UCL	0.108
		95% Standard Bootstrap UCL	0.104
Anderson-Darling Test Statistic	7.875	95% Bootstrap-t UCL	0.283
Anderson-Darling 5% Critical Value	0.824	95% Hall's Bootstrap UCL	0.309
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	0.106
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	0.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.183
		97.5% Chebyshev(Mean, Sd) UCL	0.236
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.341
95% Approximate Gamma UCL	0.0968		
95% Adjusted Gamma UCL	0.099		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.341

Result or 1/2 DL (beryllium)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	28
Raw Statistics		Log-transformed Statistics	
Minimum	0.013	Minimum of Log Data	-4.343
Maximum	2.88	Maximum of Log Data	1.058
Mean	0.752	Mean of log Data	-0.509
Median	0.695	SD of log Data	0.881
SD	0.461		
Coefficient of Variation	0.613		
Skewness	2.77		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.702
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.882	95% H-UCL	1.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.503
95% Adjusted-CLT UCL	0.916	97.5% Chebyshev (MVUE) UCL	1.776
95% Modified-t UCL	0.888	99% Chebyshev (MVUE) UCL	2.312
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.199	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.342		
nu star	158.3		
Approximate Chi Square Value (.05)	130.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.879
Adjusted Chi Square Value	129.1	95% Jackknife UCL	0.882
		95% Standard Bootstrap UCL	0.874
Anderson-Darling Test Statistic	2.229	95% Bootstrap-t UCL	0.94

Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	1.53
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	0.885
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	0.921
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.087
		97.5% Chebyshev(Mean, Sd) UCL	1.232
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.516
95% Approximate Gamma UCL	0.914		
95% Adjusted Gamma UCL	0.923		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.087

Result or 1/2 DL (bis(2-ethylhexyl)phthalate)

General Statistics			
Number of Valid Samples		36	
			Number of Unique Samples
			34
Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	0.239	Maximum of Log Data	-1.431
Mean	0.0428	Mean of log Data	-3.438
Median	0.0282	SD of log Data	0.703
SD	0.0446		
Coefficient of Variation	1.041		
Skewness	3.194		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0554	95% H-UCL	0.0527
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0635
95% Adjusted-CLT UCL	0.0593	97.5% Chebyshev (MVUE) UCL	0.0733
95% Modified-t UCL	0.0561	99% Chebyshev (MVUE) UCL	0.0926

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.75	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0245		
nu star	126		
Approximate Chi Square Value (.05)	101.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0551
Adjusted Chi Square Value	100.1	95% Jackknife UCL	0.0554
		95% Standard Bootstrap UCL	0.0548
Anderson-Darling Test Statistic	2.221	95% Bootstrap-t UCL	0.0674
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	0.0691
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	0.0562
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.0599
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0753
		97.5% Chebyshev(Mean, Sd) UCL	0.0893

Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.117
95% Approximate Gamma UCL		0.0534				
95% Adjusted Gamma UCL		0.054				
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		0.0753	
Result or 1/2 DL (boron)						
General Statistics						
Number of Valid Samples		36	Number of Unique Samples		35	
Raw Statistics			Log-transformed Statistics			
Minimum		0.555	Minimum of Log Data		-0.589	
Maximum		39.2	Maximum of Log Data		3.669	
Mean		7.576	Mean of log Data		1.383	
Median		5.27	SD of log Data		1.32	
SD		7.826				
Coefficient of Variation		1.033				
Skewness		2.044				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.801	Shapiro Wilk Test Statistic		0.863	
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		9.779	95% H-UCL		17.75	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		20.02	
95% Adjusted-CLT UCL		10.2	97.5% Chebyshev (MVUE) UCL		24.73	
95% Modified-t UCL		9.853	99% Chebyshev (MVUE) UCL		33.99	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.852	Data do not follow a Discernable Distribution (0.05)			
Theta Star		8.892				
nu star		61.34				
Approximate Chi Square Value (.05)		44.33	Nonparametric Statistics			
Adjusted Level of Significance		0.0428	95% CLT UCL		9.721	
Adjusted Chi Square Value		43.67	95% Jackknife UCL		9.779	
			95% Standard Bootstrap UCL		9.629	
Anderson-Darling Test Statistic		1.037	95% Bootstrap-t UCL		10.46	
Anderson-Darling 5% Critical Value		0.781	95% Hall's Bootstrap UCL		10.98	
Kolmogorov-Smirnov Test Statistic		0.18	95% Percentile Bootstrap UCL		9.74	
Kolmogorov-Smirnov 5% Critical Value		0.152	95% BCA Bootstrap UCL		10.28	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		13.26	
			97.5% Chebyshev(Mean, Sd) UCL		15.72	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		20.55	
95% Approximate Gamma UCL		10.48				
95% Adjusted Gamma UCL		10.64				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		20.55	

Result or 1/2 DL (bromoform)			
General Statistics			
Number of Valid Samples		19	
Number of Unique Samples		19	
Raw Statistics		Log-transformed Statistics	
Minimum	6.8500E-5	Minimum of Log Data	-9.589
Maximum	0.018	Maximum of Log Data	-4.017
Mean	0.0023	Mean of log Data	-8.057
Median	9.2500E-5	SD of log Data	2.053
SD	0.0046		
Coefficient of Variation	1.992		
Skewness	2.642		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.687
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0042	95% H-UCL	0.0217
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0069
95% Adjusted-CLT UCL	0.0048	97.5% Chebyshev (MVUE) UCL	0.0091
95% Modified-t UCL	0.0043	99% Chebyshev (MVUE) UCL	0.0133
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.32	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0073		
nu star	12.14		
Approximate Chi Square Value (.05)	5.322	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0041
Adjusted Chi Square Value	4.931	95% Jackknife UCL	0.0042
		95% Standard Bootstrap UCL	0.0040
Anderson-Darling Test Statistic	2.937	95% Bootstrap-t UCL	0.0072
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	0.0119
Kolmogorov-Smirnov Test Statistic	0.421	95% Percentile Bootstrap UCL	0.0042
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.0049
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0070
		97.5% Chebyshev(Mean, Sd) UCL	0.0090
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.013
95% Approximate Gamma UCL	0.0053		
95% Adjusted Gamma UCL	0.0057		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.013

Result or 1/2 DL (butyl benzyl phthalate)

General Statistics

Number of Valid Samples		36	Number of Unique Samples		29
Raw Statistics			Log-transformed Statistics		
Minimum	0.0045	Minimum of Log Data	-5.389		
Maximum	0.151	Maximum of Log Data	-1.89		
Mean	0.0125	Mean of log Data	-4.877		
Median	0.0067	SD of log Data	0.703		
SD	0.0255				
Coefficient of Variation	2.039				
Skewness	4.982				
Relevant UCL Statistics					
Normal Distribution Test		Lognormal Distribution Test			
Shapiro Wilk Test Statistic	0.307	Shapiro Wilk Test Statistic	0.519		
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935		
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution			
95% Student's-t UCL	0.0197	95% H-UCL	0.0125		
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.015		
95% Adjusted-CLT UCL	0.0233	97.5% Chebyshev (MVUE) UCL	0.0174		
95% Modified-t UCL	0.0203	99% Chebyshev (MVUE) UCL	0.0219		
Gamma Distribution Test		Data Distribution			
k star (bias corrected)	1.069	Data do not follow a Discernable Distribution (0.05)			
Theta Star	0.0117				
nu star	76.97				
Approximate Chi Square Value (.05)	57.76	Nonparametric Statistics			
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0195		
Adjusted Chi Square Value	57	95% Jackknife UCL	0.0197		
		95% Standard Bootstrap UCL	0.0194		
Anderson-Darling Test Statistic	8.924	95% Bootstrap-t UCL	0.0398		
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	0.0422		
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	0.0203		
Kolmogorov-Smirnov 5% Critical Value	0.151	95% BCA Bootstrap UCL	0.0245		
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.031		
		97.5% Chebyshev(Mean, Sd) UCL	0.0391		
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0548		
95% Approximate Gamma UCL	0.0167				
95% Adjusted Gamma UCL	0.0169				
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.031		

Result or 1/2 DL (cadmium)

General Statistics							
Number of Valid Samples			36	Number of Unique Samples			26
Raw Statistics				Log-transformed Statistics			
Minimum		0.003		Minimum of Log Data		-5.809	
Maximum		0.8		Maximum of Log Data		-0.223	

Mean	0.193	Mean of log Data	-3.263
Median	0.0105	SD of log Data	2.139
SD	0.239		
Coefficient of Variation	1.24		
Skewness	0.849		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.76	Shapiro Wilk Test Statistic	0.786
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.26	95% H-UCL	1.572
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.004
95% Adjusted-CLT UCL	0.265	97.5% Chebyshev (MVUE) UCL	1.302
95% Modified-t UCL	0.261	99% Chebyshev (MVUE) UCL	1.887
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.39	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.494		
nu star	28.11		
Approximate Chi Square Value (.05)	17.02	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.259
Adjusted Chi Square Value	16.62	95% Jackknife UCL	0.26
		95% Standard Bootstrap UCL	0.257
Anderson-Darling Test Statistic	3.561	95% Bootstrap-t UCL	0.269
Anderson-Darling 5% Critical Value	0.833	95% Hall's Bootstrap UCL	0.264
Kolmogorov-Smirnov Test Statistic	0.313	95% Percentile Bootstrap UCL	0.261
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.262
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.367
		97.5% Chebyshev(Mean, Sd) UCL	0.442
		99% Chebyshev(Mean, Sd) UCL	0.59
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.319		
95% Adjusted Gamma UCL	0.326		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.59

Result or 1/2 DL (carbon disulfide)

General Statistics

Number of Valid Samples		19	Number of Unique Samples		19
Raw Statistics			Log-transformed Statistics		
Minimum	4.4000E-5		Minimum of Log Data	-10.03	
Maximum	0.0284		Maximum of Log Data	-3.561	
Mean	0.0028		Mean of log Data	-8.197	
Median	5.8000E-5		SD of log Data	2.3	
SD	0.0066				
Coefficient of Variation	2.34				
Skewness	3.51				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.733
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0054	95% H-UCL	0.0531
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.01
95% Adjusted-CLT UCL	0.0066	97.5% Chebyshev (MVUE) UCL	0.0132
95% Modified-t UCL	0.0057	99% Chebyshev (MVUE) UCL	0.0195
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.284	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.01		
nu star	10.8		
Approximate Chi Square Value (.05)	4.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0053
Adjusted Chi Square Value	4.098	95% Jackknife UCL	0.0054
		95% Standard Bootstrap UCL	0.0051
Anderson-Darling Test Statistic	2.428	95% Bootstrap-t UCL	0.0102
Anderson-Darling 5% Critical Value	0.845	95% Hall's Bootstrap UCL	0.0129
Kolmogorov-Smirnov Test Statistic	0.384	95% Percentile Bootstrap UCL	0.0055
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0075
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0095
		97.5% Chebyshev(Mean, Sd) UCL	0.0124
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.018
95% Approximate Gamma UCL	0.0069		
95% Adjusted Gamma UCL	0.0075		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.018

Result or 1/2 DL (chromium)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	33
Raw Statistics		Log-transformed Statistics	
Minimum	7.76	Minimum of Log Data	2.049
Maximum	128	Maximum of Log Data	4.852
Mean	17.17	Mean of log Data	2.651
Median	12.8	SD of log Data	0.489
SD	19.6		
Coefficient of Variation	1.142		
Skewness	5.455		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.365	Shapiro Wilk Test Statistic	0.777
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		22.69		95% H-UCL		18.7	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		21.82	
95% Adjusted-CLT UCL		25.72		97.5% Chebyshev (MVUE) UCL		24.38	
95% Modified-t UCL		23.18		99% Chebyshev (MVUE) UCL		29.4	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		2.545		Data do not follow a Discernable Distribution (0.05)			
Theta Star		6.745					
nu star		183.3					
Approximate Chi Square Value (.05)		153		Nonparametric Statistics			
Adjusted Level of Significance		0.0428		95% CLT UCL		22.54	
Adjusted Chi Square Value		151.7		95% Jackknife UCL		22.69	
				95% Standard Bootstrap UCL		22.43	
Anderson-Darling Test Statistic		3.618		95% Bootstrap-t UCL		37.28	
Anderson-Darling 5% Critical Value		0.755		95% Hall's Bootstrap UCL		43.24	
Kolmogorov-Smirnov Test Statistic		0.223		95% Percentile Bootstrap UCL		23.43	
Kolmogorov-Smirnov 5% Critical Value		0.148		95% BCA Bootstrap UCL		27.01	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		31.41	
				97.5% Chebyshev(Mean, Sd) UCL		37.57	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL			
95% Approximate Gamma UCL		20.57					
95% Adjusted Gamma UCL		20.74					
Potential UCL to Use				Use 95% Student's-t UCL		22.69	
				or 95% Modified-t UCL		23.18	

Result or 1/2 DL (chrysene)

General Statistics			
Number of Valid Samples		36	Number of Unique Samples
			33
Raw Statistics		Log-transformed Statistics	
Minimum	0.0040	Minimum of Log Data	-5.502
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.0885	Mean of log Data	-4.382
Median	0.0050	SD of log Data	1.633
SD	0.265		
Coefficient of Variation	3.001		
Skewness	3.989		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.361	Shapiro Wilk Test Statistic	0.683
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.163	95% H-UCL	0.115

95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.112
95% Adjusted-CLT UCL		0.193		97.5% Chebyshev (MVUE) UCL		0.142
95% Modified-t UCL		0.168		99% Chebyshev (MVUE) UCL		0.2
Gamma Distribution Test				Data Distribution		
k star (bias corrected)		0.334		Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.265				
nu star		24.07				
Approximate Chi Square Value (.05)		13.9		Nonparametric Statistics		
Adjusted Level of Significance		0.0428		95% CLT UCL		0.161
Adjusted Chi Square Value		13.55		95% Jackknife UCL		0.163
				95% Standard Bootstrap UCL		0.163
Anderson-Darling Test Statistic		6.548		95% Bootstrap-t UCL		0.475
Anderson-Darling 5% Critical Value		0.847		95% Hall's Bootstrap UCL		0.489
Kolmogorov-Smirnov Test Statistic		0.37		95% Percentile Bootstrap UCL		0.166
Kolmogorov-Smirnov 5% Critical Value		0.158		95% BCA Bootstrap UCL		0.204
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.281
				97.5% Chebyshev(Mean, Sd) UCL		0.365
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.529
95% Approximate Gamma UCL		0.153				
95% Adjusted Gamma UCL		0.157				
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.529
Result or 1/2 DL (cis-1,2-dichloroethene)						
General Statistics						
Number of Valid Samples		19		Number of Unique Samples		19
Raw Statistics				Log-transformed Statistics		
Minimum		5.1000E-5		Minimum of Log Data		-9.884
Maximum		0.999		Maximum of Log Data		-0.001
Mean		0.0541		Mean of log Data		-8.276
Median		6.7000E-5		SD of log Data		2.711
SD		0.229				
Coefficient of Variation		4.232				
Skewness		4.356				
Relevant UCL Statistics						
Normal Distribution Test				Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.253		Shapiro Wilk Test Statistic		0.631
Shapiro Wilk Critical Value		0.901		Shapiro Wilk Critical Value		0.901
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution				Assuming Lognormal Distribution		
95% Student's-t UCL		0.145		95% H-UCL		0.356
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0226
95% Adjusted-CLT UCL		0.197		97.5% Chebyshev (MVUE) UCL		0.03
95% Modified-t UCL		0.154		99% Chebyshev (MVUE) UCL		0.0446
Gamma Distribution Test				Data Distribution		

k star (bias corrected)		0.157	Data do not follow a Discernable Distribution (0.05)	
Theta Star		0.345		
nu star		5.949		
Approximate Chi Square Value (.05)		1.614	Nonparametric Statistics	
Adjusted Level of Significance		0.0369	95% CLT UCL	0.14
Adjusted Chi Square Value		1.426	95% Jackknife UCL	0.145
			95% Standard Bootstrap UCL	0.138
Anderson-Darling Test Statistic		4.69	95% Bootstrap-t UCL	12.24
Anderson-Darling 5% Critical Value		0.908	95% Hall's Bootstrap UCL	7.38
Kolmogorov-Smirnov Test Statistic		0.426	95% Percentile Bootstrap UCL	0.159
Kolmogorov-Smirnov 5% Critical Value		0.222	95% BCA Bootstrap UCL	0.213
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.283
			97.5% Chebyshev(Mean, Sd) UCL	0.382
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.577
95% Approximate Gamma UCL		0.199		
95% Adjusted Gamma UCL		0.226		
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	0.577
Result or 1/2 DL (cobalt)				
General Statistics				
Number of Valid Samples		36	Number of Unique Samples	36
Raw Statistics			Log-transformed Statistics	
Minimum		2.81	Minimum of Log Data	1.033
Maximum		10.3	Maximum of Log Data	2.332
Mean		6.318	Mean of log Data	1.803
Median		6.115	SD of log Data	0.3
SD		1.743		
Coefficient of Variation		0.276		
Skewness		0.102		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.982	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL		6.808	95% H-UCL	6.944
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	7.739
95% Adjusted-CLT UCL		6.801	97.5% Chebyshev (MVUE) UCL	8.346
95% Modified-t UCL		6.809	99% Chebyshev (MVUE) UCL	9.538
Gamma Distribution Test			Data Distribution	
k star (bias corrected)		11.41	Data appear Normal at 5% Significance Level	
Theta Star		0.553		
nu star		821.8		
Approximate Chi Square Value (.05)		756.3	Nonparametric Statistics	
Adjusted Level of Significance		0.0428	95% CLT UCL	6.795

Adjusted Chi Square Value	753.4	95% Jackknife UCL	6.808
		95% Standard Bootstrap UCL	6.782
Anderson-Darling Test Statistic	0.303	95% Bootstrap-t UCL	6.811
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	6.819
Kolmogorov-Smirnov Test Statistic	0.0941	95% Percentile Bootstrap UCL	6.799
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	6.809
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.584
		97.5% Chebyshev(Mean, Sd) UCL	8.132
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.208
95% Approximate Gamma UCL	6.865		
95% Adjusted Gamma UCL	6.891		
Potential UCL to Use		Use 95% Student's-t UCL	6.808

Result or 1/2 DL (copper)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	34
Raw Statistics		Log-transformed Statistics	
Minimum	4.59	Minimum of Log Data	1.524
Maximum	200	Maximum of Log Data	5.298
Mean	18.7	Mean of log Data	2.553
Median	10.05	SD of log Data	0.689
SD	31.9		
Coefficient of Variation	1.705		
Skewness	5.536		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.347	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27.68	95% H-UCL	20.73
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.92
95% Adjusted-CLT UCL	32.69	97.5% Chebyshev (MVUE) UCL	28.71
95% Modified-t UCL	28.5	99% Chebyshev (MVUE) UCL	36.16
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.37	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.65		
nu star	98.64		
Approximate Chi Square Value (.05)	76.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	27.45
Adjusted Chi Square Value	75.85	95% Jackknife UCL	27.68
		95% Standard Bootstrap UCL	27.43
Anderson-Darling Test Statistic	2.951	95% Bootstrap-t UCL	50.7
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	60.07
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	28.98

Kolmogorov-Smirnov 5% Critical Value		0.15	95% BCA Bootstrap UCL		36.21
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		41.87
			97.5% Chebyshev(Mean, Sd) UCL		51.9
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		71.6
95% Approximate Gamma UCL		24.04			
95% Adjusted Gamma UCL		24.32			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		41.87
Result or 1/2 DL (cyclohexane)					
General Statistics					
Number of Valid Samples		19	Number of Unique Samples		19
Raw Statistics			Log-transformed Statistics		
Minimum		4.8100E-4	Minimum of Log Data		-7.64
Maximum		0.0255	Maximum of Log Data		-3.669
Mean		0.0056	Mean of log Data		-6.457
Median		6.3000E-4	SD of log Data		1.497
SD		0.0096			
Coefficient of Variation		1.696			
Skewness		1.55			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.553	Shapiro Wilk Test Statistic		0.705
Shapiro Wilk Critical Value		0.901	Shapiro Wilk Critical Value		0.901
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0094	95% H-UCL		0.016
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.012
95% Adjusted-CLT UCL		0.0101	97.5% Chebyshev (MVUE) UCL		0.0153
95% Modified-t UCL		0.0096	99% Chebyshev (MVUE) UCL		0.0218
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.452	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0125			
nu star		17.18			
Approximate Chi Square Value (.05)		8.804	Nonparametric Statistics		
Adjusted Level of Significance		0.0369	95% CLT UCL		0.0092
Adjusted Chi Square Value		8.282	95% Jackknife UCL		0.0094
			95% Standard Bootstrap UCL		0.0090
Anderson-Darling Test Statistic		3.232	95% Bootstrap-t UCL		0.0118
Anderson-Darling 5% Critical Value		0.804	95% Hall's Bootstrap UCL		0.0083
Kolmogorov-Smirnov Test Statistic		0.355	95% Percentile Bootstrap UCL		0.0094
Kolmogorov-Smirnov 5% Critical Value		0.21	95% BCA Bootstrap UCL		0.0105
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0153
			97.5% Chebyshev(Mean, Sd) UCL		0.0194
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0276
95% Approximate Gamma UCL		0.0111			

95% Adjusted Gamma UCL						0.0118									
Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL						0.0276			
Recommended UCL exceeds the maximum observation															
Result or 1/2 DL (dibenz(a,h)anthracene)															
General Statistics															
Number of Valid Samples				36		Number of Unique Samples				26					
Raw Statistics						Log-transformed Statistics									
				Minimum		0.0034						Minimum of Log Data		-5.674	
				Maximum		0.404						Maximum of Log Data		-0.906	
				Mean		0.0384						Mean of log Data		-4.616	
				Median		0.0054						SD of log Data		1.398	
				SD		0.0833									
				Coefficient of Variation		2.166									
				Skewness		3.088									
Relevant UCL Statistics															
Normal Distribution Test						Lognormal Distribution Test									
				Shapiro Wilk Test Statistic		0.49						Shapiro Wilk Test Statistic		0.646	
				Shapiro Wilk Critical Value		0.935						Shapiro Wilk Critical Value		0.935	
Data not Normal at 5% Significance Level						Data not Lognormal at 5% Significance Level									
Assuming Normal Distribution						Assuming Lognormal Distribution									
				95% Student's-t UCL		0.0619						95% H-UCL		0.052	
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL								0.0571	
				95% Adjusted-CLT UCL		0.0689						97.5% Chebyshev (MVUE) UCL		0.0709	
				95% Modified-t UCL		0.0631						99% Chebyshev (MVUE) UCL		0.0982	
Gamma Distribution Test						Data Distribution									
				k star (bias corrected)		0.451		Data do not follow a Discernable Distribution (0.05)							
				Theta Star		0.0852									
				nu star		32.49									
				Approximate Chi Square Value (.05)		20.46		Nonparametric Statistics							
				Adjusted Level of Significance		0.0428						95% CLT UCL		0.0613	
				Adjusted Chi Square Value		20.02						95% Jackknife UCL		0.0619	
												95% Standard Bootstrap UCL		0.0615	
				Anderson-Darling Test Statistic		7.096						95% Bootstrap-t UCL		0.0836	
				Anderson-Darling 5% Critical Value		0.819						95% Hall's Bootstrap UCL		0.0724	
				Kolmogorov-Smirnov Test Statistic		0.456						95% Percentile Bootstrap UCL		0.0633	
				Kolmogorov-Smirnov 5% Critical Value		0.156						95% BCA Bootstrap UCL		0.0733	
Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL								0.0989	
						97.5% Chebyshev(Mean, Sd) UCL								0.125	
Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL								0.177	
				95% Approximate Gamma UCL		0.0611									
				95% Adjusted Gamma UCL		0.0624									
Potential UCL to Use						Use 99% Chebyshev (Mean, Sd) UCL						0.177			

Result or 1/2 DL (dibenzofuran)			
General Statistics			
Number of Valid Samples	36	Number of Unique Samples	27
Raw Statistics		Log-transformed Statistics	
Minimum	0.0030	Minimum of Log Data	-5.799
Maximum	0.0862	Maximum of Log Data	-2.451
Mean	0.0099	Mean of log Data	-4.945
Median	0.0075	SD of log Data	0.667
SD	0.0145		
Coefficient of Variation	1.457		
Skewness	4.686		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.375	Shapiro Wilk Test Statistic	0.732
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.014	95% H-UCL	0.0112
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0135
95% Adjusted-CLT UCL	0.0159	97.5% Chebyshev (MVUE) UCL	0.0155
95% Modified-t UCL	0.0143	99% Chebyshev (MVUE) UCL	0.0194
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.523	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0065		
nu star	109.7		
Approximate Chi Square Value (.05)	86.51	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0139
Adjusted Chi Square Value	85.57	95% Jackknife UCL	0.014
		95% Standard Bootstrap UCL	0.0137
Anderson-Darling Test Statistic	5.17	95% Bootstrap-t UCL	0.0303
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	0.0344
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	0.0141
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.0172
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0205
		97.5% Chebyshev(Mean, Sd) UCL	0.025
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.034
95% Approximate Gamma UCL	0.0126		
95% Adjusted Gamma UCL	0.0128		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0205

Result or 1/2 DL (diethyl phthalate)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	29

Raw Statistics				Log-transformed Statistics			
	Minimum	0.0037		Minimum of Log Data	-5.578		
	Maximum	0.0498		Maximum of Log Data	-3		
	Mean	0.0097		Mean of log Data	-4.752		
	Median	0.0092		SD of log Data	0.448		
	SD	0.0072					
	Coefficient of Variation	0.743					
	Skewness	5.035					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.413			Shapiro Wilk Test Statistic	0.712	
	Shapiro Wilk Critical Value	0.935			Shapiro Wilk Critical Value	0.935	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
	95% Student's-t UCL	0.0118			95% H-UCL	0.011	
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	0.0127	
	95% Adjusted-CLT UCL	0.0128			97.5% Chebyshev (MVUE) UCL	0.0141	
	95% Modified-t UCL	0.012			99% Chebyshev (MVUE) UCL	0.0168	
Gamma Distribution Test				Data Distribution			
	k star (bias corrected)	3.92		Data do not follow a Discernable Distribution (0.05)			
	Theta Star	0.0024					
	nu star	282.3					
	Approximate Chi Square Value (.05)	244.3		Nonparametric Statistics			
	Adjusted Level of Significance	0.0428			95% CLT UCL	0.0117	
	Adjusted Chi Square Value	242.7			95% Jackknife UCL	0.0118	
					95% Standard Bootstrap UCL	0.0117	
	Anderson-Darling Test Statistic	4.813			95% Bootstrap-t UCL	0.0146	
	Anderson-Darling 5% Critical Value	0.752			95% Hall's Bootstrap UCL	0.0208	
	Kolmogorov-Smirnov Test Statistic	0.332			95% Percentile Bootstrap UCL	0.012	
	Kolmogorov-Smirnov 5% Critical Value	0.147			95% BCA Bootstrap UCL	0.0135	
Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL	0.015	
					97.5% Chebyshev(Mean, Sd) UCL	0.0173	
					99% Chebyshev(Mean, Sd) UCL	0.0218	
Assuming Gamma Distribution							
	95% Approximate Gamma UCL	0.0113					
	95% Adjusted Gamma UCL	0.0113					
Potential UCL to Use					Use 95% Student's-t UCL	0.0118	
					or 95% Modified-t UCL	0.012	
Result or 1/2 DL (di-n-butyl phthalate)							
General Statistics							
	Number of Valid Samples	36			Number of Unique Samples	31	
Raw Statistics				Log-transformed Statistics			
	Minimum	0.0039			Minimum of Log Data	-5.525	
	Maximum	0.0835			Maximum of Log Data	-2.483	

Mean	0.0155	Mean of log Data	-4.358
Median	0.0154	SD of log Data	0.624
SD	0.0128		
Coefficient of Variation	0.822		
Skewness	4.448		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.486	Shapiro Wilk Test Statistic	0.744
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0191	95% H-UCL	0.0192
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.023
95% Adjusted-CLT UCL	0.0207	97.5% Chebyshev (MVUE) UCL	0.0262
95% Modified-t UCL	0.0194	99% Chebyshev (MVUE) UCL	0.0326
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.534	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0061		
nu star	182.4		
Approximate Chi Square Value (.05)	152.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.019
Adjusted Chi Square Value	150.9	95% Jackknife UCL	0.0191
		95% Standard Bootstrap UCL	0.0189
Anderson-Darling Test Statistic	4.3	95% Bootstrap-t UCL	0.0225
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	0.035
Kolmogorov-Smirnov Test Statistic	0.308	95% Percentile Bootstrap UCL	0.0195
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	0.0214
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0248
		97.5% Chebyshev(Mean, Sd) UCL	0.0288
		99% Chebyshev(Mean, Sd) UCL	0.0367
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.0186		
95% Adjusted Gamma UCL	0.0188		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0248

Result or 1/2 DL (di-n-octyl phthalate)

General Statistics

Number of Valid Samples	36	Number of Unique Samples	30
Raw Statistics		Log-transformed Statistics	
Minimum	0.0041	Minimum of Log Data	-5.48
Maximum	0.123	Maximum of Log Data	-2.096
Mean	0.0115	Mean of log Data	-4.921
Median	0.0047	SD of log Data	0.76
SD	0.0205		
Coefficient of Variation	1.774		
Skewness	4.971		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.376	Shapiro Wilk Test Statistic	0.707
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0173	95% H-UCL	0.0128
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0155
95% Adjusted-CLT UCL	0.0202	97.5% Chebyshev (MVUE) UCL	0.018
95% Modified-t UCL	0.0178	99% Chebyshev (MVUE) UCL	0.023
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.146	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0101		
nu star	82.54		
Approximate Chi Square Value (.05)	62.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0171
Adjusted Chi Square Value	61.81	95% Jackknife UCL	0.0173
		95% Standard Bootstrap UCL	0.0172
Anderson-Darling Test Statistic	5.068	95% Bootstrap-t UCL	0.0314
Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	0.0385
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	0.0178
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	0.0216
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0264
		97.5% Chebyshev(Mean, Sd) UCL	0.0328
		99% Chebyshev(Mean, Sd) UCL	0.0455
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.0152		
95% Adjusted Gamma UCL	0.0154		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0264

Result or 1/2 DL (ethylbenzene)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	8.7000E-5	Minimum of Log Data	-9.35
Maximum	0.0050	Maximum of Log Data	-5.294
Mean	0.0016	Mean of log Data	-7.578
Median	1.1400E-4	SD of log Data	1.78
SD	0.0019		
Coefficient of Variation	1.168		
Skewness	0.735		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.748
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0024		95% H-UCL		0.0128	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0065	
95% Adjusted-CLT UCL		0.0024		97.5% Chebyshev (MVUE) UCL		0.0085	
95% Modified-t UCL		0.0024		99% Chebyshev (MVUE) UCL		0.0123	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.484		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0034					
nu star		18.4					
Approximate Chi Square Value (.05)		9.677		Nonparametric Statistics			
Adjusted Level of Significance		0.0369		95% CLT UCL		0.0024	
Adjusted Chi Square Value		9.127		95% Jackknife UCL		0.0024	
				95% Standard Bootstrap UCL		0.0023	
Anderson-Darling Test Statistic		2.006		95% Bootstrap-t UCL		0.0025	
Anderson-Darling 5% Critical Value		0.8		95% Hall's Bootstrap UCL		0.0023	
Kolmogorov-Smirnov Test Statistic		0.336		95% Percentile Bootstrap UCL		0.0024	
Kolmogorov-Smirnov 5% Critical Value		0.209		95% BCA Bootstrap UCL		0.0024	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0036	
				97.5% Chebyshev(Mean, Sd) UCL		0.0044	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0061	
95% Approximate Gamma UCL		0.0031					
95% Adjusted Gamma UCL		0.0033					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.0061	
Recommended UCL exceeds the maximum observation							

Result or 1/2 DL (fluoranthene)

General Statistics					
Number of Valid Samples		36	Number of Unique Samples		26
Raw Statistics			Log-transformed Statistics		
Minimum		0.0033	Minimum of Log Data		-5.69
Maximum		2.19	Maximum of Log Data		0.784
Mean		0.146	Mean of log Data		-4.243
Median		0.0063	SD of log Data		1.752
SD		0.469			
Coefficient of Variation		3.217			
Skewness		3.949			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.339	Shapiro Wilk Test Statistic		0.697
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.278	95% H-UCL		0.181

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.164
95% Adjusted-CLT UCL	0.329	97.5% Chebyshev (MVUE) UCL		0.209
95% Modified-t UCL	0.286	99% Chebyshev (MVUE) UCL		0.296
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.292	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.499			
nu star	21			
Approximate Chi Square Value (.05)	11.59	Nonparametric Statistics		
Adjusted Level of Significance	0.0428	95% CLT UCL		0.274
Adjusted Chi Square Value	11.27	95% Jackknife UCL		0.278
		95% Standard Bootstrap UCL		0.271
Anderson-Darling Test Statistic	6.927	95% Bootstrap-t UCL		0.911
Anderson-Darling 5% Critical Value	0.858	95% Hall's Bootstrap UCL		0.856
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL		0.281
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL		0.352
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.486
		97.5% Chebyshev(Mean, Sd) UCL		0.633
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.923
95% Approximate Gamma UCL	0.264			
95% Adjusted Gamma UCL	0.271			
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL		0.923

Result or 1/2 DL (fluorene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	25
Raw Statistics		Log-transformed Statistics	
Minimum	0.0034	Minimum of Log Data	-5.674
Maximum	0.141	Maximum of Log Data	-1.959
Mean	0.0112	Mean of log Data	-5.042
Median	0.0053	SD of log Data	0.774
SD	0.0235		
Coefficient of Variation	2.098		
Skewness	5.169		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.329	Shapiro Wilk Test Statistic	0.623
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0178	95% H-UCL	0.0115
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.014
95% Adjusted-CLT UCL	0.0212	97.5% Chebyshev (MVUE) UCL	0.0163
95% Modified-t UCL	0.0183	99% Chebyshev (MVUE) UCL	0.0208
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.978	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0114		
nu star	70.43		
Approximate Chi Square Value (.05)	52.11	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0176
Adjusted Chi Square Value	51.39	95% Jackknife UCL	0.0178
		95% Standard Bootstrap UCL	0.0176
Anderson-Darling Test Statistic	7.344	95% Bootstrap-t UCL	0.035
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	0.0372
Kolmogorov-Smirnov Test Statistic	0.454	95% Percentile Bootstrap UCL	0.0181
Kolmogorov-Smirnov 5% Critical Value	0.151	95% BCA Bootstrap UCL	0.0227
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0282
		97.5% Chebyshev(Mean, Sd) UCL	0.0356
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0501
95% Approximate Gamma UCL	0.0151		
95% Adjusted Gamma UCL	0.0153		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0282

Result or 1/2 DL (indeno(1,2,3-cd)pyrene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	28
Raw Statistics		Log-transformed Statistics	
Minimum	0.007	Minimum of Log Data	-4.962
Maximum	1.51	Maximum of Log Data	0.412
Mean	0.113	Mean of log Data	-3.647
Median	0.0092	SD of log Data	1.563
SD	0.279		
Coefficient of Variation	2.469		
Skewness	4.199		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.427	Shapiro Wilk Test Statistic	0.762
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.192	95% H-UCL	0.201
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.204
95% Adjusted-CLT UCL	0.225	97.5% Chebyshev (MVUE) UCL	0.257
95% Modified-t UCL	0.197	99% Chebyshev (MVUE) UCL	0.361
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.423	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.268		
nu star	30.45		
Approximate Chi Square Value (.05)	18.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.19

Adjusted Chi Square Value		18.43	95% Jackknife UCL		0.192
			95% Standard Bootstrap UCL		0.19
Anderson-Darling Test Statistic		4.43	95% Bootstrap-t UCL		0.396
Anderson-Darling 5% Critical Value		0.825	95% Hall's Bootstrap UCL		0.517
Kolmogorov-Smirnov Test Statistic		0.35	95% Percentile Bootstrap UCL		0.198
Kolmogorov-Smirnov 5% Critical Value		0.156	95% BCA Bootstrap UCL		0.243
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.316
			97.5% Chebyshev(Mean, Sd) UCL		0.404
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.577
95% Approximate Gamma UCL		0.183			
95% Adjusted Gamma UCL		0.187			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.577
Result or 1/2 DL (iron)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		32
Raw Statistics			Log-transformed Statistics		
Minimum		7120	Minimum of Log Data		8.871
Maximum		102000	Maximum of Log Data		11.53
Mean		17531	Mean of log Data		9.638
Median		15350	SD of log Data		0.436
SD		15039			
Coefficient of Variation		0.858			
Skewness		5.318			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.41	Shapiro Wilk Test Statistic		0.824
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		21765	95% H-UCL		19358
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		22337
95% Adjusted-CLT UCL		24027	97.5% Chebyshev (MVUE) UCL		24726
95% Modified-t UCL		22136	99% Chebyshev (MVUE) UCL		29419
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		3.588	Data do not follow a Discernable Distribution (0.05)		
Theta Star		4885			
nu star		258.4			
Approximate Chi Square Value (.05)		222.1	Nonparametric Statistics		
Adjusted Level of Significance		0.0428	95% CLT UCL		21653
Adjusted Chi Square Value		220.6	95% Jackknife UCL		21765
			95% Standard Bootstrap UCL		21576
Anderson-Darling Test Statistic		2.629	95% Bootstrap-t UCL		29376
Anderson-Darling 5% Critical Value		0.753	95% Hall's Bootstrap UCL		38680
Kolmogorov-Smirnov Test Statistic		0.213	95% Percentile Bootstrap UCL		22237

Kolmogorov-Smirnov 5% Critical Value		0.148	95% BCA Bootstrap UCL		24682
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		28456
			97.5% Chebyshev(Mean, Sd) UCL		33183
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		42470
95% Approximate Gamma UCL		20389			
95% Adjusted Gamma UCL		20529			
Potential UCL to Use			Use 95% Student's-t UCL		21765
			or 95% Modified-t UCL		22136
Result or 1/2 DL (lead)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		31
Raw Statistics			Log-transformed Statistics		
Minimum		5.88	Minimum of Log Data		1.772
Maximum		471	Maximum of Log Data		6.155
Mean		37.8	Mean of log Data		2.932
Median		15.2	SD of log Data		0.931
SD		80.99			
Coefficient of Variation		2.143			
Skewness		4.731			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.388	Shapiro Wilk Test Statistic		0.781
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		60.6	95% H-UCL		41.65
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		50.42
95% Adjusted-CLT UCL		71.37	97.5% Chebyshev (MVUE) UCL		59.92
95% Modified-t UCL		62.38	99% Chebyshev (MVUE) UCL		78.59
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.79	Data do not follow a Discernable Distribution (0.05)		
Theta Star		47.83			
nu star		56.89			
Approximate Chi Square Value (.05)		40.55	Nonparametric Statistics		
Adjusted Level of Significance		0.0428	95% CLT UCL		60
Adjusted Chi Square Value		39.93	95% Jackknife UCL		60.6
			95% Standard Bootstrap UCL		60.09
Anderson-Darling Test Statistic		5.207	95% Bootstrap-t UCL		105.3
Anderson-Darling 5% Critical Value		0.784	95% Hall's Bootstrap UCL		130.3
Kolmogorov-Smirnov Test Statistic		0.389	95% Percentile Bootstrap UCL		61.68
Kolmogorov-Smirnov 5% Critical Value		0.152	95% BCA Bootstrap UCL		78.41
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		96.63
			97.5% Chebyshev(Mean, Sd) UCL		122.1
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		172.1

95% Approximate Gamma UCL		53.02			
95% Adjusted Gamma UCL		53.86			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		96.63
Result or 1/2 DL (lithium)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		33
Raw Statistics			Log-transformed Statistics		
	Minimum	2.59		Minimum of Log Data	0.952
	Maximum	32.2		Maximum of Log Data	3.472
	Mean	18.84		Mean of log Data	2.869
	Median	18.55		SD of log Data	0.424
	SD	5.952			
	Coefficient of Variation	0.316			
	Skewness	0.0191			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.97		Shapiro Wilk Test Statistic	0.789
	Shapiro Wilk Critical Value	0.935		Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	20.51		95% H-UCL	22.03
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	25.35
	95% Adjusted-CLT UCL	20.47		97.5% Chebyshev (MVUE) UCL	27.99
	95% Modified-t UCL	20.51		99% Chebyshev (MVUE) UCL	33.19
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	7.068	Data appear Normal at 5% Significance Level		
	Theta Star	2.665			
	nu star	508.9			
	Approximate Chi Square Value (.05)	457.6	Nonparametric Statistics		
	Adjusted Level of Significance	0.0428		95% CLT UCL	20.47
	Adjusted Chi Square Value	455.4		95% Jackknife UCL	20.51
				95% Standard Bootstrap UCL	20.44
	Anderson-Darling Test Statistic	0.738		95% Bootstrap-t UCL	20.48
	Anderson-Darling 5% Critical Value	0.749		95% Hall's Bootstrap UCL	20.47
	Kolmogorov-Smirnov Test Statistic	0.121		95% Percentile Bootstrap UCL	20.44
	Kolmogorov-Smirnov 5% Critical Value	0.147		95% BCA Bootstrap UCL	20.45
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	23.16
				97.5% Chebyshev(Mean, Sd) UCL	25.03
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	28.71
	95% Approximate Gamma UCL	20.95			
	95% Adjusted Gamma UCL	21.05			
Potential UCL to Use			Use 95% Student's-t UCL		20.51

Result or 1/2 DL (m,p-xylene)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19
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Raw Statistics

Minimum	1.6050E-4
Maximum	0.0091
Mean	0.0020
Median	2.0500E-4
SD	0.0034
Coefficient of Variation	1.668
Skewness	1.515

Log-transformed Statistics

Minimum of Log Data	-8.737
Maximum of Log Data	-4.694
Mean of log Data	-7.556
SD of log Data	1.604

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.901

Data not Normal at 5% Significance Level

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.901

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL	0.0034
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95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL	0.0036
95% Modified-t UCL	0.0035

Assuming Lognormal Distribution

95% H-UCL	0.0073
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95% Chebyshev (MVUE) UCL	0.0048
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97.5% Chebyshev (MVUE) UCL	0.0062
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99% Chebyshev (MVUE) UCL	0.0089
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Gamma Distribution Test

k star (bias corrected)	0.428
Theta Star	0.0048
nu star	16.25

Approximate Chi Square Value (.05)	8.141
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Adjusted Level of Significance	0.0369
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Adjusted Chi Square Value	7.642
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Anderson-Darling Test Statistic	3.262
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Anderson-Darling 5% Critical Value	0.81
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Kolmogorov-Smirnov Test Statistic	0.411
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Kolmogorov-Smirnov 5% Critical Value	0.211
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Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution

95% Approximate Gamma UCL	0.0041
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95% Adjusted Gamma UCL	0.0044
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Potential UCL to Use

Nonparametric Statistics

95% CLT UCL	0.0033
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95% Jackknife UCL	0.0034
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95% Standard Bootstrap UCL	0.0033
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95% Bootstrap-t UCL	0.0041
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95% Hall's Bootstrap UCL	0.0030
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95% Percentile Bootstrap UCL	0.0034
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95% BCA Bootstrap UCL	0.0036
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95% Chebyshev(Mean, Sd) UCL	0.0055
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97.5% Chebyshev(Mean, Sd) UCL	0.0070
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99% Chebyshev(Mean, Sd) UCL	0.0099
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Use 99% Chebyshev (Mean, Sd) UCL	0.0099
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Recommended UCL exceeds the maximum observation

Result or 1/2 DL (manganese)

General Statistics

Number of Valid Samples		36	Number of Unique Samples		36
Raw Statistics			Log-transformed Statistics		
Minimum	82.3		Minimum of Log Data	4.41	
Maximum	1210		Maximum of Log Data	7.098	
Mean	347		Mean of log Data	5.709	
Median	289.5		SD of log Data	0.542	
SD	204.1				
Coefficient of Variation	0.588				
Skewness	2.242				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.816		Shapiro Wilk Test Statistic	0.963	
Shapiro Wilk Critical Value	0.935		Shapiro Wilk Critical Value	0.935	
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	404.5		95% H-UCL	417.2	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	491.6	
95% Adjusted-CLT UCL	416.6		97.5% Chebyshev (MVUE) UCL	553.9	
95% Modified-t UCL	406.6		99% Chebyshev (MVUE) UCL	676.4	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	3.417		Data appear Gamma Distributed at 5% Significance Level		
Theta Star	101.6				
nu star	246				
Approximate Chi Square Value (.05)	210.7		Nonparametric Statistics		
Adjusted Level of Significance	0.0428		95% CLT UCL	403	
Adjusted Chi Square Value	209.2		95% Jackknife UCL	404.5	
			95% Standard Bootstrap UCL	401.3	
Anderson-Darling Test Statistic	0.549		95% Bootstrap-t UCL	424.9	
Anderson-Darling 5% Critical Value	0.753		95% Hall's Bootstrap UCL	467	
Kolmogorov-Smirnov Test Statistic	0.11		95% Percentile Bootstrap UCL	405.4	
Kolmogorov-Smirnov 5% Critical Value	0.148		95% BCA Bootstrap UCL	417.9	
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	495.3	
			97.5% Chebyshev(Mean, Sd) UCL	559.4	
			99% Chebyshev(Mean, Sd) UCL	685.4	
Assuming Gamma Distribution					
95% Approximate Gamma UCL	405.2				
95% Adjusted Gamma UCL	408.1				
Potential UCL to Use			Use 95% Approximate Gamma UCL	405.2	

Result or 1/2 DL (mercury)

General Statistics					
Number of Valid Samples		36	Number of Unique Samples		23
Raw Statistics			Log-transformed Statistics		
Minimum	0.0011		Minimum of Log Data	-6.768	
Maximum	0.064		Maximum of Log Data	-2.749	

Mean	0.0094	Mean of log Data	-5.346
Median	0.0074	SD of log Data	1.23
SD	0.0124		
Coefficient of Variation	1.306		
Skewness	2.923		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.667	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.013	95% H-UCL	0.0177
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0205
95% Adjusted-CLT UCL	0.0139	97.5% Chebyshev (MVUE) UCL	0.0251
95% Modified-t UCL	0.0131	99% Chebyshev (MVUE) UCL	0.0342
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.803	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0118		
nu star	57.82		
Approximate Chi Square Value (.05)	41.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.0129
Adjusted Chi Square Value	40.7	95% Jackknife UCL	0.013
		95% Standard Bootstrap UCL	0.0128
Anderson-Darling Test Statistic	1.891	95% Bootstrap-t UCL	0.0153
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	0.0288
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	0.0132
Kolmogorov-Smirnov 5% Critical Value	0.152	95% BCA Bootstrap UCL	0.0141
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0185
		97.5% Chebyshev(Mean, Sd) UCL	0.0224
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.03
95% Approximate Gamma UCL	0.0133		
95% Adjusted Gamma UCL	0.0135		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.03

Result or 1/2 DL (methylcyclohexane)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	1.4950E-4	Minimum of Log Data	-8.808
Maximum	0.0085	Maximum of Log Data	-4.762
Mean	0.0024	Mean of log Data	-7.039
Median	0.0015	SD of log Data	1.607
SD	0.0030		
Coefficient of Variation	1.259		
Skewness	1.227		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.726	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0036	95% H-UCL	0.0125
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0081
95% Adjusted-CLT UCL	0.0038	97.5% Chebyshev (MVUE) UCL	0.0105
95% Modified-t UCL	0.0037	99% Chebyshev (MVUE) UCL	0.0151
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.541	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0045		
nu star	20.57		
Approximate Chi Square Value (.05)	11.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0036
Adjusted Chi Square Value	10.67	95% Jackknife UCL	0.0036
		95% Standard Bootstrap UCL	0.0035
Anderson-Darling Test Statistic	1.396	95% Bootstrap-t UCL	0.0040
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	0.0035
Kolmogorov-Smirnov Test Statistic	0.289	95% Percentile Bootstrap UCL	0.0037
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.0039
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0055
		97.5% Chebyshev(Mean, Sd) UCL	0.0068
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0095
95% Approximate Gamma UCL	0.0044		
95% Adjusted Gamma UCL	0.0047		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0095
Recommended UCL exceeds the maximum observation			

Result or 1/2 DL (molybdenum)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	28
Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	10.7	Maximum of Log Data	2.37
Mean	0.586	Mean of log Data	-1.916
Median	0.115	SD of log Data	1.44
SD	1.788		
Coefficient of Variation	3.054		
Skewness	5.477		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.321	Shapiro Wilk Test Statistic	0.86

Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.089	95% H-UCL	0.851
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.917
95% Adjusted-CLT UCL	1.367	97.5% Chebyshev (MVUE) UCL	1.144
95% Modified-t UCL	1.135	99% Chebyshev (MVUE) UCL	1.589
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.445	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.316		
nu star	32.04		
Approximate Chi Square Value (.05)	20.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.076
Adjusted Chi Square Value	19.67	95% Jackknife UCL	1.089
		95% Standard Bootstrap UCL	1.077
Anderson-Darling Test Statistic	3.324	95% Bootstrap-t UCL	2.845
Anderson-Darling 5% Critical Value	0.82	95% Hall's Bootstrap UCL	2.784
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	1.164
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	1.557
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.885
		97.5% Chebyshev(Mean, Sd) UCL	2.447
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.551
95% Approximate Gamma UCL	0.933		
95% Adjusted Gamma UCL	0.954		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	3.551

Result or 1/2 DL (naphthalene)

General Statistics			
Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	1.5800E-4	Minimum of Log Data	-8.753
Maximum	0.251	Maximum of Log Data	-1.382
Mean	0.0236	Mean of log Data	-6.08
Median	0.0018	SD of log Data	2.079
SD	0.0644		
Coefficient of Variation	2.734		
Skewness	3.147		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.407	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0492	95% H-UCL	0.173

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0529
95% Adjusted-CLT UCL	0.0593	97.5% Chebyshev (MVUE) UCL		0.0693
95% Modified-t UCL	0.051	99% Chebyshev (MVUE) UCL		0.102
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.285	Data appear Lognormal at 5% Significance Level		
Theta Star	0.0827			
nu star	10.82			
Approximate Chi Square Value (.05)	4.458	Nonparametric Statistics		
Adjusted Level of Significance	0.0369	95% CLT UCL		0.0479
Adjusted Chi Square Value	4.107	95% Jackknife UCL		0.0492
		95% Standard Bootstrap UCL		0.0476
Anderson-Darling Test Statistic	2.192	95% Bootstrap-t UCL		0.506
Anderson-Darling 5% Critical Value	0.844	95% Hall's Bootstrap UCL		0.25
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL		0.05
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL		0.063
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.088
		97.5% Chebyshev(Mean, Sd) UCL		0.116
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.171
95% Approximate Gamma UCL	0.0571			
95% Adjusted Gamma UCL	0.062			
Potential UCL to Use		Use 99% Chebyshev (MVUE) UCL		0.102

Result or 1/2 DL (nickel)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	32
Raw Statistics		Log-transformed Statistics	
Minimum	9.74	Minimum of Log Data	2.276
Maximum	51.7	Maximum of Log Data	3.945
Mean	17.17	Mean of log Data	2.795
Median	16	SD of log Data	0.288
SD	6.788		
Coefficient of Variation	0.395		
Skewness	3.881		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.637	Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.08	95% H-UCL	18.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.67
95% Adjusted-CLT UCL	19.82	97.5% Chebyshev (MVUE) UCL	22.24
95% Modified-t UCL	19.21	99% Chebyshev (MVUE) UCL	25.32
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	9.72	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	1.767		
nu star	699.9		
Approximate Chi Square Value (.05)	639.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	19.03
Adjusted Chi Square Value	636.9	95% Jackknife UCL	19.08
		95% Standard Bootstrap UCL	18.99
Anderson-Darling Test Statistic	1.205	95% Bootstrap-t UCL	20.64
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	27.37
Kolmogorov-Smirnov Test Statistic	0.146	95% Percentile Bootstrap UCL	19.15
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	19.93
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.1
		97.5% Chebyshev(Mean, Sd) UCL	24.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.43
95% Approximate Gamma UCL	18.79		
95% Adjusted Gamma UCL	18.87		
Potential UCL to Use		Use 95% Approximate Gamma UCL	18.79

Result or 1/2 DL (phenanthrene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	30
Raw Statistics		Log-transformed Statistics	
Minimum	0.0036	Minimum of Log Data	-5.614
Maximum	1.34	Maximum of Log Data	0.293
Mean	0.0998	Mean of log Data	-4.194
Median	0.007	SD of log Data	1.57
SD	0.299		
Coefficient of Variation	2.991		
Skewness	3.832		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.354	Shapiro Wilk Test Statistic	0.743
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.184	95% H-UCL	0.119
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.12
95% Adjusted-CLT UCL	0.216	97.5% Chebyshev (MVUE) UCL	0.151
95% Modified-t UCL	0.189	99% Chebyshev (MVUE) UCL	0.212
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.344	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.29		
nu star	24.76		
Approximate Chi Square Value (.05)	14.43	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.182

Adjusted Chi Square Value	14.07	95% Jackknife UCL	0.184
		95% Standard Bootstrap UCL	0.182
Anderson-Darling Test Statistic	6.276	95% Bootstrap-t UCL	0.515
Anderson-Darling 5% Critical Value	0.845	95% Hall's Bootstrap UCL	0.538
Kolmogorov-Smirnov Test Statistic	0.359	95% Percentile Bootstrap UCL	0.187
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.218
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.317
		97.5% Chebyshev(Mean, Sd) UCL	0.411
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.595
95% Approximate Gamma UCL	0.171		
95% Adjusted Gamma UCL	0.176		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.595

Result or 1/2 DL (pyrene)

General Statistics			
Number of Valid Samples	36	Number of Unique Samples	28
Raw Statistics		Log-transformed Statistics	
Minimum	0.0044	Minimum of Log Data	-5.424
Maximum	1.97	Maximum of Log Data	0.678
Mean	0.143	Mean of log Data	-4.094
Median	0.0067	SD of log Data	1.701
SD	0.444		
Coefficient of Variation	3.103		
Skewness	3.879		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.703
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.268	95% H-UCL	0.184
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.172
95% Adjusted-CLT UCL	0.316	97.5% Chebyshev (MVUE) UCL	0.218
95% Modified-t UCL	0.276	99% Chebyshev (MVUE) UCL	0.309
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.461		
nu star	22.31		
Approximate Chi Square Value (.05)	12.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.265
Adjusted Chi Square Value	12.24	95% Jackknife UCL	0.268
		95% Standard Bootstrap UCL	0.261
Anderson-Darling Test Statistic	6.595	95% Bootstrap-t UCL	0.852
Anderson-Darling 5% Critical Value	0.853	95% Hall's Bootstrap UCL	0.824
Kolmogorov-Smirnov Test Statistic	0.37	95% Percentile Bootstrap UCL	0.268

Kolmogorov-Smirnov 5% Critical Value		0.159	95% BCA Bootstrap UCL		0.336
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.465
			97.5% Chebyshev(Mean, Sd) UCL		0.605
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.879
95% Approximate Gamma UCL		0.254			
95% Adjusted Gamma UCL		0.261			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.879
Result or 1/2 DL (silver)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		20
Raw Statistics			Log-transformed Statistics		
Minimum		0.0135	Minimum of Log Data		-4.305
Maximum		0.41	Maximum of Log Data		-0.892
Mean		0.0473	Mean of log Data		-3.473
Median		0.0298	SD of log Data		0.718
SD		0.0773			
Coefficient of Variation		1.632			
Skewness		4.047			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.382	Shapiro Wilk Test Statistic		0.695
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0691	95% H-UCL		0.0518
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0625
95% Adjusted-CLT UCL		0.0778	97.5% Chebyshev (MVUE) UCL		0.0723
95% Modified-t UCL		0.0705	99% Chebyshev (MVUE) UCL		0.0915
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		1.233	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0384			
nu star		88.81			
Approximate Chi Square Value (.05)		68.08	Nonparametric Statistics		
Adjusted Level of Significance		0.0428	95% CLT UCL		0.0685
Adjusted Chi Square Value		67.26	95% Jackknife UCL		0.0691
			95% Standard Bootstrap UCL		0.068
Anderson-Darling Test Statistic		6.224	95% Bootstrap-t UCL		0.157
Anderson-Darling 5% Critical Value		0.77	95% Hall's Bootstrap UCL		0.157
Kolmogorov-Smirnov Test Statistic		0.432	95% Percentile Bootstrap UCL		0.0709
Kolmogorov-Smirnov 5% Critical Value		0.15	95% BCA Bootstrap UCL		0.0811
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.103
			97.5% Chebyshev(Mean, Sd) UCL		0.128
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.175
95% Approximate Gamma UCL		0.0617			

95% Adjusted Gamma UCL		0.0625			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		0.103
Result or 1/2 DL (strontium)					
General Statistics					
Number of Valid Samples		36	Number of Unique Samples		35
Raw Statistics			Log-transformed Statistics		
	Minimum	22.1		Minimum of Log Data	3.096
	Maximum	96.2		Maximum of Log Data	4.566
	Mean	56.15		Mean of log Data	3.952
	Median	53		SD of log Data	0.412
	SD	20.95			
	Coefficient of Variation	0.373			
	Skewness	0.15			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.954		Shapiro Wilk Test Statistic	0.933
	Shapiro Wilk Critical Value	0.935		Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	62.05		95% H-UCL	64.44
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	73.96
	95% Adjusted-CLT UCL	61.98		97.5% Chebyshev (MVUE) UCL	81.51
	95% Modified-t UCL	62.06		99% Chebyshev (MVUE) UCL	96.36
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	6.163	Data appear Normal at 5% Significance Level		
	Theta Star	9.111			
	nu star	443.7			
	Approximate Chi Square Value (.05)	395.9	Nonparametric Statistics		
	Adjusted Level of Significance	0.0428		95% CLT UCL	61.89
	Adjusted Chi Square Value	393.8		95% Jackknife UCL	62.05
				95% Standard Bootstrap UCL	61.71
	Anderson-Darling Test Statistic	0.492		95% Bootstrap-t UCL	62.12
	Anderson-Darling 5% Critical Value	0.749		95% Hall's Bootstrap UCL	62.04
	Kolmogorov-Smirnov Test Statistic	0.106		95% Percentile Bootstrap UCL	61.53
	Kolmogorov-Smirnov 5% Critical Value	0.147		95% BCA Bootstrap UCL	61.57
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	71.37
				97.5% Chebyshev(Mean, Sd) UCL	77.95
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	90.89
	95% Approximate Gamma UCL	62.93			
	95% Adjusted Gamma UCL	63.26			
Potential UCL to Use			Use 95% Student's-t UCL		62.05

Result or 1/2 DL (tetrachloroethene)			
General Statistics			
Number of Valid Samples	19	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	7.7500E-5	Minimum of Log Data	-9.465
Maximum	0.223	Maximum of Log Data	-1.501
Mean	0.0127	Mean of log Data	-7.936
Median	1.0500E-4	SD of log Data	2.239
SD	0.0509		
Coefficient of Variation	4.004		
Skewness	4.351		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.264	Shapiro Wilk Test Statistic	0.689
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.033	95% H-UCL	0.0528
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0115
95% Adjusted-CLT UCL	0.0444	97.5% Chebyshev (MVUE) UCL	0.0151
95% Modified-t UCL	0.0349	99% Chebyshev (MVUE) UCL	0.0222
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.208	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0612		
nu star	7.9		
Approximate Chi Square Value (.05)	2.677	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.0319
Adjusted Chi Square Value	2.419	95% Jackknife UCL	0.033
		95% Standard Bootstrap UCL	0.0313
Anderson-Darling Test Statistic	3.918	95% Bootstrap-t UCL	0.477
Anderson-Darling 5% Critical Value	0.885	95% Hall's Bootstrap UCL	0.346
Kolmogorov-Smirnov Test Statistic	0.388	95% Percentile Bootstrap UCL	0.036
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	0.0482
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0637
		97.5% Chebyshev(Mean, Sd) UCL	0.0857
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.129
95% Approximate Gamma UCL	0.0375		
95% Adjusted Gamma UCL	0.0416		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.129
Result or 1/2 DL (tin)			
General Statistics			
Number of Valid Samples	36	Number of Unique Samples	20

Raw Statistics			Log-transformed Statistics		
	Minimum	0.195	Minimum of Log Data	-1.635	
	Maximum	3.67	Maximum of Log Data	1.3	
	Mean	0.47	Mean of log Data	-1.072	
	Median	0.285	SD of log Data	0.642	
	SD	0.628			
	Coefficient of Variation	1.334			
	Skewness	4.232			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.431	Shapiro Wilk Test Statistic	0.665	
	Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.647	95% H-UCL	0.524	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.627	
	95% Adjusted-CLT UCL	0.721	97.5% Chebyshev (MVUE) UCL	0.718	
	95% Modified-t UCL	0.659	99% Chebyshev (MVUE) UCL	0.896	
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	1.594	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.295			
	nu star	114.8			
	Approximate Chi Square Value (.05)	91.06	Nonparametric Statistics		
	Adjusted Level of Significance	0.0428	95% CLT UCL	0.642	
	Adjusted Chi Square Value	90.1	95% Jackknife UCL	0.647	
			95% Standard Bootstrap UCL	0.636	
	Anderson-Darling Test Statistic	6.272	95% Bootstrap-t UCL	0.881	
	Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	1.225	
	Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	0.664	
	Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	0.747	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.926	
			97.5% Chebyshev(Mean, Sd) UCL	1.124	
			99% Chebyshev(Mean, Sd) UCL	1.511	
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	0.593			
	95% Adjusted Gamma UCL	0.599			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL	0.926	

Result or 1/2 DL (titanium)

General Statistics					
	Number of Valid Samples	36	Number of Unique Samples	33	
Raw Statistics			Log-transformed Statistics		
	Minimum	3.41	Minimum of Log Data	1.227	
	Maximum	57	Maximum of Log Data	4.043	
	Mean	20.83	Mean of log Data	2.854	
	Median	17.95	SD of log Data	0.641	

SD	12.9	
Coefficient of Variation	0.619	
Skewness	1.414	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.46	95% H-UCL	26.55
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.75
95% Adjusted-CLT UCL	24.9	97.5% Chebyshev (MVUE) UCL	36.33
95% Modified-t UCL	24.54	99% Chebyshev (MVUE) UCL	45.33
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.679	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.774		
nu star	192.9		
Approximate Chi Square Value (.05)	161.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	24.36
Adjusted Chi Square Value	160.5	95% Jackknife UCL	24.46
		95% Standard Bootstrap UCL	24.39
Anderson-Darling Test Statistic	0.489	95% Bootstrap-t UCL	25.42
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	25.08
Kolmogorov-Smirnov Test Statistic	0.105	95% Percentile Bootstrap UCL	24.46
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	24.77
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.19
		97.5% Chebyshev(Mean, Sd) UCL	34.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.21
95% Approximate Gamma UCL	24.83		
95% Adjusted Gamma UCL	25.03		
Potential UCL to Use		Use 95% Approximate Gamma UCL	24.83

Result or 1/2 DL (toluene)

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	2.3900E-4	Minimum of Log Data	-8.339
Maximum	0.0127	Maximum of Log Data	-4.366
Mean	0.0046	Mean of log Data	-6.263
Median	0.0036	SD of log Data	1.613
SD	0.0047		
Coefficient of Variation	1.03		
Skewness	0.722		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.807		Shapiro Wilk Test Statistic		0.82	
Shapiro Wilk Critical Value		0.901		Shapiro Wilk Critical Value		0.901	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0065		95% H-UCL		0.0275	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0179	
95% Adjusted-CLT UCL		0.0066		97.5% Chebyshev (MVUE) UCL		0.023	
95% Modified-t UCL		0.0065		99% Chebyshev (MVUE) UCL		0.0331	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.608		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0076					
nu star		23.11					
Approximate Chi Square Value (.05)		13.18		Nonparametric Statistics			
Adjusted Level of Significance		0.0369		95% CLT UCL		0.0064	
Adjusted Chi Square Value		12.52		95% Jackknife UCL		0.0065	
				95% Standard Bootstrap UCL		0.0064	
Anderson-Darling Test Statistic		1.109		95% Bootstrap-t UCL		0.0069	
Anderson-Darling 5% Critical Value		0.785		95% Hall's Bootstrap UCL		0.0065	
Kolmogorov-Smirnov Test Statistic		0.238		95% Percentile Bootstrap UCL		0.0064	
Kolmogorov-Smirnov 5% Critical Value		0.207		95% BCA Bootstrap UCL		0.0065	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0094	
				97.5% Chebyshev(Mean, Sd) UCL		0.0115	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0156	
95% Approximate Gamma UCL		0.0081					
95% Adjusted Gamma UCL		0.0085					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.0156	
Recommended UCL exceeds the maximum observation							
Result or 1/2 DL (vanadium)							
General Statistics							
Number of Valid Samples		36		Number of Unique Samples		33	
Raw Statistics				Log-transformed Statistics			
Minimum		7.85		Minimum of Log Data		2.061	
Maximum		45.8		Maximum of Log Data		3.824	
Mean		20.54		Mean of log Data		2.936	
Median		19.55		SD of log Data		0.434	
SD		8.387					
Coefficient of Variation		0.408					
Skewness		0.649					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.958		Shapiro Wilk Test Statistic		0.96	
Shapiro Wilk Critical Value		0.935		Shapiro Wilk Critical Value		0.935	
Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		22.9		95% H-UCL		23.75	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		27.39	
95% Adjusted-CLT UCL		23		97.5% Chebyshev (MVUE) UCL		30.3	
95% Modified-t UCL		22.93		99% Chebyshev (MVUE) UCL		36.03	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		5.487		Data appear Normal at 5% Significance Level			
Theta Star		3.743					
nu star		395.1					
Approximate Chi Square Value (.05)		350		Nonparametric Statistics			
Adjusted Level of Significance		0.0428		95% CLT UCL		22.84	
Adjusted Chi Square Value		348.1		95% Jackknife UCL		22.9	
				95% Standard Bootstrap UCL		22.8	
Anderson-Darling Test Statistic		0.319		95% Bootstrap-t UCL		23.04	
Anderson-Darling 5% Critical Value		0.75		95% Hall's Bootstrap UCL		23.09	
Kolmogorov-Smirnov Test Statistic		0.0966		95% Percentile Bootstrap UCL		22.82	
Kolmogorov-Smirnov 5% Critical Value		0.147		95% BCA Bootstrap UCL		23.08	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		26.63	
				97.5% Chebyshev(Mean, Sd) UCL		29.27	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		34.45	
95% Approximate Gamma UCL		23.19					
95% Adjusted Gamma UCL		23.31					
Potential UCL to Use				Use 95% Student's-t UCL		22.9	

Result or 1/2 DL (xylene (total))

General Statistics					
Number of Valid Samples		19	Number of Unique Samples		19
Raw Statistics			Log-transformed Statistics		
Minimum	2.3100E-4	Minimum of Log Data	-8.373		
Maximum	1.76	Maximum of Log Data	0.565		
Mean	0.119	Mean of log Data	-5.435		
Median	0.0031	SD of log Data	2.87		
SD	0.4				
Coefficient of Variation	3.368				
Skewness	4.273				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.318	Shapiro Wilk Test Statistic	0.862		
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901		
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.278	95% H-UCL	14.31		
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.553	
95% Adjusted-CLT UCL	0.366	97.5% Chebyshev (MVUE) UCL	0.737		

95% Modified-t UCL		0.293	99% Chebyshev (MVUE) UCL		1.099
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.22	Data Follow Appr. Gamma Distribution at 5% Significance Level			
Theta Star	0.54				
nu star	8.358				
Approximate Chi Square Value (.05)	2.944	Nonparametric Statistics			
Adjusted Level of Significance	0.0369	95% CLT UCL		0.27	
Adjusted Chi Square Value	2.67	95% Jackknife UCL		0.278	
		95% Standard Bootstrap UCL		0.264	
Anderson-Darling Test Statistic	1.648	95% Bootstrap-t UCL		1.513	
Anderson-Darling 5% Critical Value	0.879	95% Hall's Bootstrap UCL		0.904	
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL		0.303	
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL		0.401	
Data follow Appr. Gamma Distribution at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.519
		97.5% Chebyshev(Mean, Sd) UCL		0.692	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1.032
95% Approximate Gamma UCL	0.337				
95% Adjusted Gamma UCL	0.372				
Potential UCL to Use			Use 95% Adjusted Gamma UCL		0.372

Result or 1/2 DL (zinc)

General Statistics					
Number of Valid Samples		36	Number of Unique Samples		36
Raw Statistics			Log-transformed Statistics		
Minimum	21.1	Minimum of Log Data		3.049	
Maximum	5640	Maximum of Log Data		8.638	
Mean	242.5	Mean of log Data		4.287	
Median	49.05	SD of log Data		1.039	
SD	929.4				
Coefficient of Variation	3.833				
Skewness	5.918				

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.228	Shapiro Wilk Test Statistic		0.776
Shapiro Wilk Critical Value		0.935	Shapiro Wilk Critical Value		0.935
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		504.2	95% H-UCL		191.5
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		229.8
95% Adjusted-CLT UCL		660.5	97.5% Chebyshev (MVUE) UCL		276.5
95% Modified-t UCL		529.7	99% Chebyshev (MVUE) UCL		368.1
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.499	Data do not follow a Discernable Distribution (0.05)		
Theta Star		486.3			

nu star		35.9		
Approximate Chi Square Value (.05)		23.19	Nonparametric Statistics	
Adjusted Level of Significance		0.0428	95% CLT UCL	497.3
Adjusted Chi Square Value		22.72	95% Jackknife UCL	504.2
			95% Standard Bootstrap UCL	499.1
Anderson-Darling Test Statistic		6.288	95% Bootstrap-t UCL	2637
Anderson-Darling 5% Critical Value		0.81	95% Hall's Bootstrap UCL	1588
Kolmogorov-Smirnov Test Statistic		0.315	95% Percentile Bootstrap UCL	550.3
Kolmogorov-Smirnov 5% Critical Value		0.155	95% BCA Bootstrap UCL	832.6
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	917.7
			97.5% Chebyshev(Mean, Sd) UCL	1210
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	1784
95% Approximate Gamma UCL		375.4		
95% Adjusted Gamma UCL		383.1		
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	1784

APPENDIX A-5

BACKGROUND SOIL

General UCL Statistics for Full Data Sets			
User Selected Options			
From File	J:\1352 - Gulfco R\riskleco\Tables for Revisited SLERA\background soil table.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Result or 1/2 SDL (antimony)			
General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.125	Minimum of Log Data	-2.079
Maximum	2.19	Maximum of Log Data	0.784
Mean	0.953	Mean of log Data	-0.711
Median	0.815	SD of log Data	1.345
SD	0.878		
Coefficient of Variation	0.921		
Skewness	0.157		
Relevant UCL Statistics		Lognormal Distribution Test	
Normal Distribution Test			
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk Test Statistic	0.726
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.462	95% H-UCL	6.827
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.117
95% Adjusted-CLT UCL	1.424	97.5% Chebyshev (MVUE) UCL	4.01
95% Modified-t UCL	1.464	99% Chebyshev (MVUE) UCL	5.765
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.685	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.39		
nu star	13.71		
Approximate Chi Square Value (.05)	6.373	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	1.41
Adjusted Chi Square Value	5.527	95% Jackknife UCL	1.462
		95% Standard Bootstrap UCL	1.381
Anderson-Darling Test Statistic	1.346	95% Bootstrap-t UCL	1.452
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	1.306
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	1.394
Kolmogorov-Smirnov 5% Critical Value	0.275	95% BCA Bootstrap UCL	1.416
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.163
		97.5% Chebyshev(Mean, Sd) UCL	2.687
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.715
95% Approximate Gamma UCL	2.05		
95% Adjusted Gamma UCL	2.364		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	3.715
Recommended UCL exceeds the maximum observation			
Result or 1/2 SDL (arsenic)			
General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.24	Minimum of Log Data	-1.427
Maximum	5.9	Maximum of Log Data	1.775
Mean	3.438	Mean of log Data	0.985
Median	3.625	SD of log Data	0.947
SD	1.792		
Coefficient of Variation	0.521		
Skewness	-0.35		
Relevant UCL Statistics		Lognormal Distribution Test	
Normal Distribution Test			
Shapiro Wilk Test Statistic	0.946	Shapiro Wilk Test Statistic	0.749
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.477	95% H-UCL	10.79
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.349
95% Adjusted-CLT UCL	4.303	97.5% Chebyshev (MVUE) UCL	11.68
95% Modified-t UCL	4.466	99% Chebyshev (MVUE) UCL	16.27
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.572	Data appear Normal at 5% Significance Level	
Theta Star	2.187		
nu star	31.44		

Approximate Chi Square Value (.05)	19.63	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	4.37
Adjusted Chi Square Value	18.03	95% Jackknife UCL	4.477
		95% Standard Bootstrap UCL	4.299
Anderson-Darling Test Statistic	0.699	95% Bootstrap-t UCL	4.371
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	4.292
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	4.299
Kolmogorov-Smirnov 5% Critical Value	0.27	95% BCA Bootstrap UCL	4.27
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.908
		97.5% Chebyshev(Mean, Sd) UCL	6.976
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.075
95% Approximate Gamma UCL	5.507		
95% Adjusted Gamma UCL	5.997		
Potential UCL to Use		Use 95% Student's-t UCL	4.477

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	150	Minimum of Log Data	5.011
Maximum	1130	Maximum of Log Data	7.03
Mean	333.1	Mean of log Data	5.617
Median	259	SD of log Data	0.571
SD	288.1		
Coefficient of Variation	0.865		
Skewness	2.844		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.59	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	500.1	95% H-UCL	504
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	573.9
95% Adjusted-CLT UCL	570.5	97.5% Chebyshev (MVUE) UCL	684.7
95% Modified-t UCL	513.7	99% Chebyshev (MVUE) UCL	902.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.005	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	166.1		
nu star	40.11		
Approximate Chi Square Value (.05)	26.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	482.9
Adjusted Chi Square Value	24.7	95% Jackknife UCL	500.1
		95% Standard Bootstrap UCL	476.3
Anderson-Darling Test Statistic	1.01	95% Bootstrap-t UCL	877.8
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	1100
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	505.4
Kolmogorov-Smirnov 5% Critical Value	0.269	95% BCA Bootstrap UCL	601.4
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	730.2
		97.5% Chebyshev(Mean, Sd) UCL	902
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1239
95% Approximate Gamma UCL	502.3		
95% Adjusted Gamma UCL	540.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	502.3

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.00323	Minimum of Log Data	-5.735
Maximum	0.082	Maximum of Log Data	-2.501
Mean	0.0116	Mean of log Data	-5.267
Median	0.00381	SD of log Data	0.979
SD	0.0247		
Coefficient of Variation	2.125		
Skewness	3.16		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.383	Shapiro Wilk Test Statistic	0.478
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.026	95% H-UCL	0.0226

95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	0.0189
95% Adjusted-CLT UCL	0.0328 97.5% Chebyshev (MVUE) UCL	0.0236
95% Modified-t UCL	0.0273 99% Chebyshev (MVUE) UCL	0.033
Gamma Distribution Test	Data Distribution	
k star (bias corrected)	0.583 Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.02	
nu star	11.66	
Approximate Chi Square Value (.05)	5.004 Nonparametric Statistics	
Adjusted Level of Significance	0.0267 95% CLT UCL	0.0245
Adjusted Chi Square Value	4.271 95% Jackknife UCL	0.026
	95% Standard Bootstrap UCL	0.0238
Anderson-Darling Test Statistic	2.903 95% Bootstrap-t UCL	0.543
Anderson-Darling 5% Critical Value	0.758 95% Hall's Bootstrap UCL	0.258
Kolmogorov-Smirnov Test Statistic	0.513 95% Percentile Bootstrap UCL	0.0272
Kolmogorov-Smirnov 5% Critical Value	0.276 95% BCA Bootstrap UCL	0.0351
Data not Gamma Distributed at 5% Significance Level	95% Chebyshev(Mean, Sd) UCL	0.0457
	97.5% Chebyshev(Mean, Sd) UCL	0.0605
Assuming Gamma Distribution	99% Chebyshev(Mean, Sd) UCL	0.0894
95% Approximate Gamma UCL	0.0271	
95% Adjusted Gamma UCL	0.0318	
Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	0.0457

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics		
Number of Valid Samples	10 Number of Unique Samples	7
Raw Statistics	Log-transformed Statistics	
Minimum	0.00434 Minimum of Log Data	-5.44
Maximum	0.076 Maximum of Log Data	-2.577
Mean	0.0122 Mean of log Data	-5.008
Median	0.005 SD of log Data	0.863
SD	0.0224	
Coefficient of Variation	1.833	
Skewness	3.157	
Relevant UCL Statistics	Lognormal Distribution Test	
Normal Distribution Test	0.391 Shapiro Wilk Test Statistic	0.495
Shapiro Wilk Test Statistic	0.842 Shapiro Wilk Critical Value	0.842
Shapiro Wilk Critical Value	Data not Lognormal at 5% Significance Level	
Data not Normal at 5% Significance Level		
Assuming Normal Distribution	Assuming Lognormal Distribution	
95% Student's-t UCL	0.0252 95% H-UCL	0.0219
95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	0.0207
95% Adjusted-CLT UCL	0.0314 97.5% Chebyshev (MVUE) UCL	0.0257
95% Modified-t UCL	0.0264 99% Chebyshev (MVUE) UCL	0.0354
Gamma Distribution Test	Data Distribution	
k star (bias corrected)	0.739 Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0165	
nu star	14.78	
Approximate Chi Square Value (.05)	7.109 Nonparametric Statistics	
Adjusted Level of Significance	0.0267 95% CLT UCL	0.0239
Adjusted Chi Square Value	6.207 95% Jackknife UCL	0.0252
	95% Standard Bootstrap UCL	0.0233
Anderson-Darling Test Statistic	2.773 95% Bootstrap-t UCL	0.307
Anderson-Darling 5% Critical Value	0.75 95% Hall's Bootstrap UCL	0.171
Kolmogorov-Smirnov Test Statistic	0.505 95% Percentile Bootstrap UCL	0.0263
Kolmogorov-Smirnov 5% Critical Value	0.274 95% BCA Bootstrap UCL	0.0334
Data not Gamma Distributed at 5% Significance Level	95% Chebyshev(Mean, Sd) UCL	0.0431
	97.5% Chebyshev(Mean, Sd) UCL	0.0565
Assuming Gamma Distribution	99% Chebyshev(Mean, Sd) UCL	0.0828
95% Approximate Gamma UCL	0.0254	
95% Adjusted Gamma UCL	0.0291	
Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	0.0431

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics		
Number of Valid Samples	10 Number of Unique Samples	10
Raw Statistics	Log-transformed Statistics	
Minimum	0.00349 Minimum of Log Data	-5.658
Maximum	0.057 Maximum of Log Data	-2.865
Mean	0.00941 Mean of log Data	-5.234
Median	0.00411 SD of log Data	0.84
SD	0.0167	
Coefficient of Variation	1.777	
Skewness	3.157	

Relevant UCL Statistics		
Normal Distribution Test	Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.393 Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.842 Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level	Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution	Assuming Lognormal Distribution	
95% Student's-t UCL	0.0191 95% H-UCL	0.0166
95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	0.016
95% Adjusted-CLT UCL	0.0238 97.5% Chebyshev (MVUE) UCL	0.0198
95% Modified-t UCL	0.02 99% Chebyshev (MVUE) UCL	0.0272
Gamma Distribution Test	Data Distribution	
k star (bias corrected)	0.777 Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0121	
nu star	15.53	
Approximate Chi Square Value (.05)	7.632 Nonparametric Statistics	
Adjusted Level of Significance	0.0267 95% CLT UCL	0.0181
Adjusted Chi Square Value	6.692 95% Jackknife UCL	0.0191
	95% Standard Bootstrap UCL	0.0179
Anderson-Darling Test Statistic	2.757 95% Bootstrap-t UCL	0.231
Anderson-Darling 5% Critical Value	0.748 95% Hall's Bootstrap UCL	0.116
Kolmogorov-Smirnov Test Statistic	0.496 95% Percentile Bootstrap UCL	0.02
Kolmogorov-Smirnov 5% Critical Value	0.274 95% BCA Bootstrap UCL	0.0252
Data not Gamma Distributed at 5% Significance Level	95% Chebyshev(Mean, Sd) UCL	0.0325
	97.5% Chebyshev(Mean, Sd) UCL	0.0424
Assuming Gamma Distribution	99% Chebyshev(Mean, Sd) UCL	0.062
95% Approximate Gamma UCL	0.0192	
95% Adjusted Gamma UCL	0.0218	
Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	0.0325
Result or 1/2 SDL (benzo(g,h,i)perylene)		
General Statistics		
Number of Valid Samples	10 Number of Unique Samples	9
Raw Statistics	Log-transformed Statistics	
Minimum	0.015 Minimum of Log Data	-4.2
Maximum	0.083 Maximum of Log Data	-2.489
Mean	0.0241 Mean of log Data	-3.896
Median	0.0173 SD of log Data	0.508
SD	0.0208	
Coefficient of Variation	0.866	
Skewness	3.104	
Relevant UCL Statistics		
Normal Distribution Test	Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.458 Shapiro Wilk Test Statistic	0.581
Shapiro Wilk Critical Value	0.842 Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level	Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution	Assuming Lognormal Distribution	
95% Student's-t UCL	0.0361 95% H-UCL	0.0337
95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	0.0391
95% Adjusted-CLT UCL	0.0418 97.5% Chebyshev (MVUE) UCL	0.0461
95% Modified-t UCL	0.0372 99% Chebyshev (MVUE) UCL	0.0599
Gamma Distribution Test	Data Distribution	
k star (bias corrected)	2.254 Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0107	
nu star	45.09	
Approximate Chi Square Value (.05)	30.68 Nonparametric Statistics	
Adjusted Level of Significance	0.0267 95% CLT UCL	0.0349
Adjusted Chi Square Value	28.63 95% Jackknife UCL	0.0361
	95% Standard Bootstrap UCL	0.034
Anderson-Darling Test Statistic	2.124 95% Bootstrap-t UCL	0.111
Anderson-Darling 5% Critical Value	0.732 95% Hall's Bootstrap UCL	0.0864
Kolmogorov-Smirnov Test Statistic	0.417 95% Percentile Bootstrap UCL	0.0365
Kolmogorov-Smirnov 5% Critical Value	0.268 95% BCA Bootstrap UCL	0.038
Data not Gamma Distributed at 5% Significance Level	95% Chebyshev(Mean, Sd) UCL	0.0527
	97.5% Chebyshev(Mean, Sd) UCL	0.0652
Assuming Gamma Distribution	99% Chebyshev(Mean, Sd) UCL	0.0895
95% Approximate Gamma UCL	0.0353	
95% Adjusted Gamma UCL	0.0379	
Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	0.0527
Result or 1/2 SDL (benzo(k)fluoranthene)		
General Statistics		
Number of Valid Samples	10 Number of Unique Samples	7
Raw Statistics	Log-transformed Statistics	

Minimum	0.00493	Minimum of Log Data	-5.313
Maximum	0.106	Maximum of Log Data	-2.244
Mean	0.0158	Mean of log Data	-4.861
Median	0.00575	SD of log Data	0.927
SD	0.0317		
Coefficient of Variation	2		
Skewness	3.16		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.386	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0342	95% H-UCL	0.0296
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0263
95% Adjusted-CLT UCL	0.043	97.5% Chebyshev (MVUE) UCL	0.0328
95% Modified-t UCL	0.0359	99% Chebyshev (MVUE) UCL	0.0455
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.644	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0246		
nu star	12.88		
Approximate Chi Square Value (.05)	5.815	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0323
Adjusted Chi Square Value	5.014	95% Jackknife UCL	0.0342
		95% Standard Bootstrap UCL	0.0311
Anderson-Darling Test Statistic	2.864	95% Bootstrap-t UCL	0.608
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	0.269
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	0.0358
Kolmogorov-Smirnov 5% Critical Value	0.275	95% BCA Bootstrap UCL	0.046
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0595
		97.5% Chebyshev(Mean, Sd) UCL	0.0784
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.116
95% Approximate Gamma UCL	0.0351		
95% Adjusted Gamma UCL	0.0407		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0595
Result or 1/2 SDL (cadmium)			
General Statistics			
Number of Valid Samples	10	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.0075	Minimum of Log Data	-4.893
Maximum	0.11	Maximum of Log Data	-2.207
Mean	0.0311	Mean of log Data	-4.091
Median	0.0095	SD of log Data	1.081
SD	0.0398		
Coefficient of Variation	1.283		
Skewness	1.571		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.641	Shapiro Wilk Test Statistic	0.713
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0541	95% H-UCL	0.0974
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.071
95% Adjusted-CLT UCL	0.0585	97.5% Chebyshev (MVUE) UCL	0.0898
95% Modified-t UCL	0.0552	99% Chebyshev (MVUE) UCL	0.127
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.725	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0428		
nu star	14.5		
Approximate Chi Square Value (.05)	6.912	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0518
Adjusted Chi Square Value	6.025	95% Jackknife UCL	0.0541
		95% Standard Bootstrap UCL	0.0507
Anderson-Darling Test Statistic	1.584	95% Bootstrap-t UCL	0.105
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.0699
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.0515
Kolmogorov-Smirnov 5% Critical Value	0.274	95% BCA Bootstrap UCL	0.0581
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.086
		97.5% Chebyshev(Mean, Sd) UCL	0.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.156
95% Approximate Gamma UCL	0.0651		
95% Adjusted Gamma UCL	0.0747		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.156

Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (carbazole)

General Statistics		
Number of Valid Samples	10 Number of Unique Samples	9
Raw Statistics		
Minimum	0.00376	Log-transformed Statistics
Maximum	0.011	Minimum of Log Data
Mean	0.00512	Maximum of Log Data
Median	0.00443	Mean of log Data
SD	0.00214	SD of log Data
Coefficient of Variation	0.418	
Skewness	2.781	
Relevant UCL Statistics		
Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.608	Shapiro Wilk Test Statistic
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level
Assuming Normal Distribution		
95% Student's-t UCL	0.00636	Assuming Lognormal Distribution
95% UCLs (Adjusted for Skewness)		95% H-UCL
95% Adjusted-CLT UCL	0.00687	95% Chebyshev (MVUE) UCL
95% Modified-t UCL	0.00646	97.5% Chebyshev (MVUE) UCL
		99% Chebyshev (MVUE) UCL
Gamma Distribution Test		
k star (bias corrected)	6.758	Data Distribution
Theta Star	7.57E-04	Data do not follow a Discernable Distribution (0.05)
nu star	135.2	
Approximate Chi Square Value (.05)	109.3	Nonparametric Statistics
Adjusted Level of Significance	0.0267	95% CLT UCL
Adjusted Chi Square Value	105.3	95% Jackknife UCL
		95% Standard Bootstrap UCL
Anderson-Darling Test Statistic	1.249	95% Bootstrap-t UCL
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL
		97.5% Chebyshev(Mean, Sd) UCL
		99% Chebyshev(Mean, Sd) UCL
Assuming Gamma Distribution		
95% Approximate Gamma UCL	0.00633	
95% Adjusted Gamma UCL	0.00657	
Potential UCL to Use		
		Use 95% Student's-t UCL
		or 95% Modified-t UCL

Result or 1/2 SDL (chromium)

General Statistics		
Number of Valid Samples	10 Number of Unique Samples	9
Raw Statistics		
Minimum	10.7	Log-transformed Statistics
Maximum	20.1	Minimum of Log Data
Mean	15.2	Maximum of Log Data
Median	14.15	Mean of log Data
SD	3.02	SD of log Data
Coefficient of Variation	0.199	
Skewness	0.27	
Relevant UCL Statistics		
Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level
Assuming Normal Distribution		
95% Student's-t UCL	16.95	Assuming Lognormal Distribution
95% UCLs (Adjusted for Skewness)		95% H-UCL
95% Adjusted-CLT UCL	16.86	95% Chebyshev (MVUE) UCL
95% Modified-t UCL	16.96	97.5% Chebyshev (MVUE) UCL
		99% Chebyshev (MVUE) UCL
Gamma Distribution Test		
k star (bias corrected)	19.81	Data Distribution
Theta Star	0.767	Data appear Normal at 5% Significance Level
nu star	396.2	
Approximate Chi Square Value (.05)	351.1	Nonparametric Statistics
Adjusted Level of Significance	0.0267	95% CLT UCL
Adjusted Chi Square Value	343.7	95% Jackknife UCL
		95% Standard Bootstrap UCL
Anderson-Darling Test Statistic	0.388	95% Bootstrap-t UCL

Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	16.75
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	16.71
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	16.74
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.36
		97.5% Chebyshev(Mean, Sd) UCL	21.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.7
95% Approximate Gamma UCL	17.15		
95% Adjusted Gamma UCL	17.52		

k star (bias corrected)	7.922	Data appear Normal at 5% Significance Level	
Theta Star	1.529		
nu star	158.4		
Approximate Chi Square Value (.05)	130.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	14.17
Adjusted Chi Square Value	125.9	95% Jackknife UCL	14.41
		95% Standard Bootstrap UCL	14.08
Anderson-Darling Test Statistic	0.317	95% Bootstrap-t UCL	15.03
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	14.63
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	14.04
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	14.54
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.57
		97.5% Chebyshev(Mean, Sd) UCL	19.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.56
95% Approximate Gamma UCL	14.73		
95% Adjusted Gamma UCL	15.25		
Potential UCL to Use		Use 95% Student's-t UCL	14.41

Result or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	7
Raw Statistics		Log-transformed Statistics	
Minimum	0.00486	Minimum of Log Data	-5.328
Maximum	0.156	Maximum of Log Data	-1.858
Mean	0.0208	Mean of log Data	-4.834
Median	0.00575	SD of log Data	1.053
SD	0.0475		
Coefficient of Variation	2.286		
Skewness	3.161		
Relevant UCL Statistics		Lognormal Distribution Test	
Normal Distribution Test			
Shapiro Wilk Test Statistic	0.38	Shapiro Wilk Test Statistic	0.477
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0483	95% H-UCL	0.0428
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0324
95% Adjusted-CLT UCL	0.0615	97.5% Chebyshev (MVUE) UCL	0.0409
95% Modified-t UCL	0.0508	99% Chebyshev (MVUE) UCL	0.0575
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.513	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0405		
nu star	10.26		
Approximate Chi Square Value (.05)	4.106	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0455
Adjusted Chi Square Value	3.456	95% Jackknife UCL	0.0483
		95% Standard Bootstrap UCL	0.0443
Anderson-Darling Test Statistic	2.929	95% Bootstrap-t UCL	1.171
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	0.527
Kolmogorov-Smirnov Test Statistic	0.515	95% Percentile Bootstrap UCL	0.0508
Kolmogorov-Smirnov 5% Critical Value	0.278	95% BCA Bootstrap UCL	0.0659
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0863
		97.5% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.17
95% Approximate Gamma UCL	0.0519		
95% Adjusted Gamma UCL	0.0617		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.17
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (Indeno(1,2,3-cd)pyrene)

General Statistics			
Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.0125	Minimum of Log Data	-4.382
Maximum	0.417	Maximum of Log Data	-0.875
Mean	0.0551	Mean of log Data	-3.88
Median	0.0148	SD of log Data	1.063
SD	0.127		
Coefficient of Variation	2.308		
Skewness	3.161		
Relevant UCL Statistics		Lognormal Distribution Test	
Normal Distribution Test			
Shapiro Wilk Test Statistic	0.379	Shapiro Wilk Test Statistic	0.47
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842

Data not Normal at 5% Significance Level

Assuming Normal Distribution
 95% Student's-t UCL
 95% UCLs (Adjusted for Skewness)
 95% Adjusted-CLT UCL
 95% Modified-t UCL

Gamma Distribution Test
 k star (bias corrected)
 Theta Star
 nu star
 Approximate Chi Square Value (.05)
 Adjusted Level of Significance
 Adjusted Chi Square Value

Anderson-Darling Test Statistic
 Anderson-Darling 5% Critical Value
 Kolmogorov-Smirnov Test Statistic
 Kolmogorov-Smirnov 5% Critical Value
 Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution
 95% Approximate Gamma UCL
 95% Adjusted Gamma UCL

Potential UCL to Use
 Recommended UCL exceeds the maximum observation

Result or 1/2 SDL (lead)

General Statistics

Number of Valid Samples

Raw Statistics

Minimum
 Maximum
 Mean
 Median
 SD
 Coefficient of Variation
 Skewness

Relevant UCL Statistics

Normal Distribution Test
 Shapiro Wilk Test Statistic
 Shapiro Wilk Critical Value
 Data appear Normal at 5% Significance Level

Assuming Normal Distribution
 95% Student's-t UCL
 95% UCLs (Adjusted for Skewness)
 95% Adjusted-CLT UCL
 95% Modified-t UCL

Gamma Distribution Test
 k star (bias corrected)
 Theta Star
 nu star
 Approximate Chi Square Value (.05)
 Adjusted Level of Significance
 Adjusted Chi Square Value

Anderson-Darling Test Statistic
 Anderson-Darling 5% Critical Value
 Kolmogorov-Smirnov Test Statistic
 Kolmogorov-Smirnov 5% Critical Value
 Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution
 95% Approximate Gamma UCL
 95% Adjusted Gamma UCL

Potential UCL to Use

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples

Raw Statistics

Minimum
 Maximum
 Mean

Data not Lognormal at 5% Significance Level

Assuming Lognormal Distribution
 95% H-UCL
 95% Chebyshev (MVUE) UCL
 97.5% Chebyshev (MVUE) UCL
 99% Chebyshev (MVUE) UCL

Data Distribution
 Data do not follow a Discernable Distribution (0.05)

4 Nonparametric Statistics
 95% CLT UCL
 95% Jackknife UCL
 95% Standard Bootstrap UCL
 95% Bootstrap-t UCL
 95% Hall's Bootstrap UCL
 95% Percentile Bootstrap UCL
 95% BCA Bootstrap UCL

95% Chebyshev(Mean, Sd) UCL
 97.5% Chebyshev(Mean, Sd) UCL
 99% Chebyshev(Mean, Sd) UCL

Use 99% Chebyshev (Mean, Sd) UCL

10 Number of Unique Samples

Log-transformed Statistics

11 Minimum of Log Data
 15.2 Maximum of Log Data
 13.43 Mean of log Data
 13.35 SD of log Data

Lognormal Distribution Test

0.913 Shapiro Wilk Test Statistic
 0.842 Shapiro Wilk Critical Value
 Data appear Lognormal at 5% Significance Level

Assuming Lognormal Distribution
 95% H-UCL
 95% Chebyshev (MVUE) UCL
 97.5% Chebyshev (MVUE) UCL
 99% Chebyshev (MVUE) UCL

Data Distribution
 57 Data appear Normal at 5% Significance Level

1063 Nonparametric Statistics
 95% CLT UCL
 95% Jackknife UCL
 95% Standard Bootstrap UCL
 95% Bootstrap-t UCL
 95% Hall's Bootstrap UCL
 95% Percentile Bootstrap UCL
 95% BCA Bootstrap UCL

95% Chebyshev(Mean, Sd) UCL
 97.5% Chebyshev(Mean, Sd) UCL
 99% Chebyshev(Mean, Sd) UCL

Use 95% Student's-t UCL

10 Number of Unique Samples

Log-transformed Statistics

14.4 Minimum of Log Data
 32.5 Maximum of Log Data
 21.14 Mean of log Data

0.114
 0.0853
 0.108
 0.152

0.121
 0.129
 0.119
 3.62
 1.642
 0.135
 0.175
 0.23
 0.306
 0.455

0.455

9

2.398
 2.721
 2.591
 0.118

0.909
 0.842

14.43
 15.62
 16.56
 18.42

14.23
 14.33
 14.18
 14.21
 14.11
 14.17
 14.15
 15.56
 16.49
 18.3

14.33

10

2.667
 3.481
 3.027

Median	19.9	SD of log Data	0.229
SD	5.168		
Coefficient of Variation	0.244		
Skewness	1.214		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.13	95% H-UCL	24.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.82
95% Adjusted-CLT UCL	24.5	97.5% Chebyshev (MVUE) UCL	30.72
95% Modified-t UCL	24.24	99% Chebyshev (MVUE) UCL	36.42
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.43	Data appear Normal at 5% Significance Level	
Theta Star	1.465		
nu star	288.6		
Approximate Chi Square Value (.05)	250.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	23.83
Adjusted Chi Square Value	244.1	95% Jackknife UCL	24.13
		95% Standard Bootstrap UCL	23.71
Anderson-Darling Test Statistic	0.311	95% Bootstrap-t UCL	26.29
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	40.64
Kolmogorov-Smirnov Test Statistic	0.2	95% Percentile Bootstrap UCL	23.88
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	24.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.26
		97.5% Chebyshev(Mean, Sd) UCL	31.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.39
95% Approximate Gamma UCL	24.38		
95% Adjusted Gamma UCL	25		
Potential UCL to Use		Use 95% Student's-t UCL	24.13
Result or 1/2 SDL (manganese)			
General Statistics			
Number of Valid Samples	10	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	284	Minimum of Log Data	5.649
Maximum	551	Maximum of Log Data	6.312
Mean	377.4	Mean of log Data	5.909
Median	333	SD of log Data	0.227
SD	93.76		
Coefficient of Variation	0.248		
Skewness	1.28		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.843
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	431.8	95% H-UCL	436.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	495.4
95% Adjusted-CLT UCL	439	97.5% Chebyshev (MVUE) UCL	546.6
95% Modified-t UCL	433.8	99% Chebyshev (MVUE) UCL	647.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.38	Data appear Lognormal at 5% Significance Level	
Theta Star	26.25		
nu star	287.6		
Approximate Chi Square Value (.05)	249.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	426.2
Adjusted Chi Square Value	243.1	95% Jackknife UCL	431.8
		95% Standard Bootstrap UCL	422.7
Anderson-Darling Test Statistic	0.85	95% Bootstrap-t UCL	494.2
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	681.2
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	425.6
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	436.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	506.6
		97.5% Chebyshev(Mean, Sd) UCL	562.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	672.4
95% Approximate Gamma UCL	435.3		
95% Adjusted Gamma UCL	446.4		
Potential UCL to Use		Use 95% Student's-t UCL	431.8
		or 95% Modified-t UCL	433.8
		or 95% H-UCL	436.5

Result or 1/2 SDL (mercury)

General Statistics		
Number of Valid Samples	10	Number of Unique Samples 8
Raw Statistics		
Log-transformed Statistics		
Minimum	0.015	Minimum of Log Data -4.2
Maximum	0.03	Maximum of Log Data -3.507
Mean	0.0213	Mean of log Data -3.871
Median	0.0195	SD of log Data 0.217
SD	0.00479	
Coefficient of Variation	0.225	
Skewness	0.734	
Relevant UCL Statistics		
Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.908	Shapiro Wilk Test Statistic 0.937
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value 0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level
Assuming Normal Distribution		
Assuming Lognormal Distribution		
95% Student's-t UCL	0.0241	95% H-UCL 0.0245
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL 0.0277
95% Adjusted-CLT UCL	0.0242	97.5% Chebyshev (MVUE) UCL 0.0305
95% Modified-t UCL	0.0241	99% Chebyshev (MVUE) UCL 0.0359
Gamma Distribution Test		
Data Distribution		
k star (bias corrected)	16.3	Data appear Normal at 5% Significance Level
Theta Star	0.00131	
nu star	326.1	
Approximate Chi Square Value (.05)	285.2	Nonparametric Statistics
Adjusted Level of Significance	0.0267	95% CLT UCL 0.0238
Adjusted Chi Square Value	278.6	95% Jackknife UCL 0.0241
		95% Standard Bootstrap UCL 0.0236
Anderson-Darling Test Statistic	0.458	95% Bootstrap-t UCL 0.0246
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL 0.024
Kolmogorov-Smirnov Test Statistic	0.2	95% Percentile Bootstrap UCL 0.0238
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL 0.0239
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 0.0279
		97.5% Chebyshev(Mean, Sd) UCL 0.0308
		99% Chebyshev(Mean, Sd) UCL 0.0364
Assuming Gamma Distribution		
95% Approximate Gamma UCL	0.0243	
95% Adjusted Gamma UCL	0.0249	
Potential UCL to Use		Use 95% Student's-t UCL 0.0241

Result or 1/2 SDL (molybdenum)

General Statistics		
Number of Valid Samples	10	Number of Unique Samples 10
Raw Statistics		
Log-transformed Statistics		
Minimum	0.42	Minimum of Log Data -0.868
Maximum	0.68	Maximum of Log Data -0.386
Mean	0.522	Mean of log Data -0.659
Median	0.505	SD of log Data 0.137
SD	0.0739	
Coefficient of Variation	0.142	
Skewness	0.94	
Relevant UCL Statistics		
Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic 0.974
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value 0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level
Assuming Normal Distribution		
Assuming Lognormal Distribution		
95% Student's-t UCL	0.565	95% H-UCL 0.568
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL 0.621
95% Adjusted-CLT UCL	0.568	97.5% Chebyshev (MVUE) UCL 0.663
95% Modified-t UCL	0.566	99% Chebyshev (MVUE) UCL 0.747
Gamma Distribution Test		
Data Distribution		
k star (bias corrected)	40.85	Data appear Normal at 5% Significance Level
Theta Star	0.0128	
nu star	817	
Approximate Chi Square Value (.05)	751.7	Nonparametric Statistics
Adjusted Level of Significance	0.0267	95% CLT UCL 0.56
Adjusted Chi Square Value	740.8	95% Jackknife UCL 0.565
		95% Standard Bootstrap UCL 0.56
Anderson-Darling Test Statistic	0.217	95% Bootstrap-t UCL 0.579
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL 0.59
Kolmogorov-Smirnov Test Statistic	0.153	95% Percentile Bootstrap UCL 0.558
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL 0.561

Data appear Gamma Distributed at 5% Significance Level	95% Chebyshev(Mean, Sd) UCL	0.624
	97.5% Chebyshev(Mean, Sd) UCL	0.668
	99% Chebyshev(Mean, Sd) UCL	0.755
Assuming Gamma Distribution		
95% Approximate Gamma UCL	0.567	
95% Adjusted Gamma UCL	0.576	
Potential UCL to Use	Use 95% Student's-t UCL	0.565
Result or 1/2 SDL (phenanthrene)		
General Statistics		
Number of Valid Samples	10 Number of Unique Samples	10
Raw Statistics		
	Log-transformed Statistics	
Minimum	0.00286 Minimum of Log Data	-5.859
Maximum	0.137 Maximum of Log Data	-1.988
Mean	0.0167 Mean of log Data	-5.327
Median	0.00336 SD of log Data	1.179
SD	0.0423	
Coefficient of Variation	2.525	
Skewness	3.162	
Relevant UCL Statistics		
Normal Distribution Test	Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.375 Shapiro Wilk Test Statistic	0.459
Shapiro Wilk Critical Value	0.842 Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level	Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		
95% Student's-t UCL	0.0412 95% H-UCL	0.0383
95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	0.0239
95% Adjusted-CLT UCL	0.053 97.5% Chebyshev (MVUE) UCL	0.0304
95% Modified-t UCL	0.0435 99% Chebyshev (MVUE) UCL	0.0432
Gamma Distribution Test		
k star (bias corrected)	0.425 Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0394	
nu star	8.497	
Approximate Chi Square Value (.05)	3.026 Nonparametric Statistics	
Adjusted Level of Significance	0.0267 95% CLT UCL	0.0387
Adjusted Chi Square Value	2.487 95% Jackknife UCL	0.0412
		0.0378
Anderson-Darling Test Statistic	3.041 95% Standard Bootstrap UCL	
Anderson-Darling 5% Critical Value	0.776 95% Bootstrap-t UCL	1.724
Kolmogorov-Smirnov Test Statistic	0.53 95% Hall's Bootstrap UCL	0.748
Kolmogorov-Smirnov 5% Critical Value	0.281 95% Percentile Bootstrap UCL	0.0434
Data not Gamma Distributed at 5% Significance Level		0.0568
	95% Chebyshev(Mean, Sd) UCL	0.075
	97.5% Chebyshev(Mean, Sd) UCL	0.1
	99% Chebyshev(Mean, Sd) UCL	0.15
Assuming Gamma Distribution		
95% Approximate Gamma UCL	0.047	
95% Adjusted Gamma UCL	0.0572	
Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	0.15
Recommended UCL exceeds the maximum observation		

Result or 1/2 SDL (pyrene)

General Statistics		
Number of Valid Samples	10 Number of Unique Samples	7
Raw Statistics		
	Log-transformed Statistics	
Minimum	0.0085 Minimum of Log Data	-4.768
Maximum	0.127 Maximum of Log Data	-2.064
Mean	0.0218 Mean of log Data	-4.347
Median	0.01 SD of log Data	0.811
SD	0.037	
Coefficient of Variation	1.696	
Skewness	3.156	
Relevant UCL Statistics		
Normal Distribution Test	Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.396 Shapiro Wilk Test Statistic	0.501
Shapiro Wilk Critical Value	0.842 Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level	Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		
95% Student's-t UCL	0.0432 95% H-UCL	0.0376
95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	0.0373
95% Adjusted-CLT UCL	0.0535 97.5% Chebyshev (MVUE) UCL	0.046
95% Modified-t UCL	0.0452 99% Chebyshev (MVUE) UCL	0.063
Gamma Distribution Test		
k star (bias corrected)	0.834 Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0262	

nu star	16.67		
Approximate Chi Square Value (.05)	8.437	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.041
Adjusted Chi Square Value	7.441	95% Jackknife UCL	0.0432
		95% Standard Bootstrap UCL	0.0404
Anderson-Darling Test Statistic	2.722	95% Bootstrap-t UCL	0.464
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	0.239
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	0.0452
Kolmogorov-Smirnov 5% Critical Value	0.273	95% BCA Bootstrap UCL	0.0564
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0728
		97.5% Chebyshev(Mean, Sd) UCL	0.0948
		99% Chebyshev(Mean, Sd) UCL	0.138
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.0431		
95% Adjusted Gamma UCL	0.0488		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0728
Result or 1/2 SDL (zinc)			
General Statistics			
Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	36.6	Minimum of Log Data	3.6
Maximum	969	Maximum of Log Data	6.876
Mean	247	Mean of log Data	4.667
Median	75.5	SD of log Data	1.272
SD	364.6		
Coefficient of Variation	1.476		
Skewness	1.694		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.62	Shapiro Wilk Test Statistic	0.795
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	458.3	95% H-UCL	1141
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	602.7
95% Adjusted-CLT UCL	502.6	97.5% Chebyshev (MVUE) UCL	772.1
95% Modified-t UCL	468.6	99% Chebyshev (MVUE) UCL	1105
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.567	Data do not follow a Discernable Distribution (0.05)	
Theta Star	435.3		
nu star	11.35		
Approximate Chi Square Value (.05)	4.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	436.6
Adjusted Chi Square Value	4.085	95% Jackknife UCL	458.3
		95% Standard Bootstrap UCL	426.1
Anderson-Darling Test Statistic	1.247	95% Bootstrap-t UCL	1346
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	1691
Kolmogorov-Smirnov Test Statistic	0.346	95% Percentile Bootstrap UCL	430.3
Kolmogorov-Smirnov 5% Critical Value	0.277	95% BCA Bootstrap UCL	496.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	749.5
		97.5% Chebyshev(Mean, Sd) UCL	967
		99% Chebyshev(Mean, Sd) UCL	1394
Assuming Gamma Distribution			
95% Approximate Gamma UCL	583.8		
95% Adjusted Gamma UCL	685.9		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1394
Recommended UCL exceeds the maximum observation			

APPENDIX A-6

INTRACOASTAL WATERWAY SEDIMENT

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Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL				0.0011				
Result or 1/2 SDL (1,2diphenylhydrazine/azobenzen)												
General Statistics												
Number of Valid Samples				16		Number of Unique Samples				13		
Raw Statistics					Log-transformed Statistics							
Minimum				0.0050		Minimum of Log Data				-5.288		
Maximum				0.0317		Maximum of Log Data				-3.451		
Mean				0.0073		Mean of log Data				-5.056		
Median				0.0054		SD of log Data				0.447		
SD				0.0065								
Coefficient of Variation				0.883								
Skewness				3.903								
Relevant UCL Statistics												
Normal Distribution Test					Lognormal Distribution Test							
Shapiro Wilk Test Statistic				0.369		Shapiro Wilk Test Statistic				0.515		
Shapiro Wilk Critical Value				0.887		Shapiro Wilk Critical Value				0.887		
Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level							
Assuming Normal Distribution					Assuming Lognormal Distribution							
95% Student's-t UCL				0.0103		95% H-UCL				0.0088		
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL					0.0105		
95% Adjusted-CLT UCL				0.0118		97.5% Chebyshev (MVUE) UCL				0.012		
95% Modified-t UCL				0.0105		99% Chebyshev (MVUE) UCL				0.015		
Gamma Distribution Test					Data Distribution							
k star (bias corrected)				2.896		Data do not follow a Discernable Distribution (0.05)						
Theta Star				0.0025								
nu star				92.68								
Approximate Chi Square Value (.05)				71.48		Nonparametric Statistics						
Adjusted Level of Significance				0.0335		95% CLT UCL				0.0101		
Adjusted Chi Square Value				69.36		95% Jackknife UCL				0.0103		
						95% Standard Bootstrap UCL				0.0099		
Anderson-Darling Test Statistic				3.453		95% Bootstrap-t UCL				0.0268		
Anderson-Darling 5% Critical Value				0.743		95% Hall's Bootstrap UCL				0.0205		
Kolmogorov-Smirnov Test Statistic				0.376		95% Percentile Bootstrap UCL				0.0106		
Kolmogorov-Smirnov 5% Critical Value				0.216		95% BCA Bootstrap UCL				0.0124		
Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL					0.0145		
					97.5% Chebyshev(Mean, Sd) UCL					0.0176		
Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL					0.0236		
95% Approximate Gamma UCL				0.0095								
95% Adjusted Gamma UCL				0.0098								
Potential UCL to Use					Use 95% Student's-t UCL					0.0103		
					or 95% Modified-t UCL					0.0105		
Result or 1/2 SDL (2-methylnaphthalene)												

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0066	Minimum of Log Data	-5.021
Maximum	0.0188	Maximum of Log Data	-3.974
Mean	0.0083	Mean of log Data	-4.828
Median	0.0073	SD of log Data	0.261
SD	0.0029		
Coefficient of Variation	0.357		
Skewness	3.264		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.566	Shapiro Wilk Test Statistic	0.699
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0096	95% H-UCL	0.0093
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0106
95% Adjusted-CLT UCL	0.0102	97.5% Chebyshev (MVUE) UCL	0.0117
95% Modified-t UCL	0.0097	99% Chebyshev (MVUE) UCL	0.0137
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.55	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.8871E-4		
nu star	337.5		
Approximate Chi Square Value (.05)	295.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0095
Adjusted Chi Square Value	291.5	95% Jackknife UCL	0.0096
		95% Standard Bootstrap UCL	0.0094
Anderson-Darling Test Statistic	1.783	95% Bootstrap-t UCL	0.0116
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.0139
Kolmogorov-Smirnov Test Statistic	0.24	95% Percentile Bootstrap UCL	0.0096
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0104
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0116
		97.5% Chebyshev(Mean, Sd) UCL	0.013
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0157
95% Approximate Gamma UCL	0.0094		
95% Adjusted Gamma UCL	0.0096		
Potential UCL to Use		Use 95% Student's-t UCL	0.0096
		or 95% Modified-t UCL	0.0097

Result or 1/2 SDL (3,3'-dichlorobenzidine)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16

Raw Statistics			Log-transformed Statistics		
	Minimum	0.0293		Minimum of Log Data	-3.53
	Maximum	0.151		Maximum of Log Data	-1.89
	Mean	0.0408		Mean of log Data	-3.312
	Median	0.0316		SD of log Data	0.4
	SD	0.0297			
	Coefficient of Variation	0.729			
	Skewness	3.845			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.396		Shapiro Wilk Test Statistic	0.541
	Shapiro Wilk Critical Value	0.887		Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.0538		95% H-UCL	0.0483
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0568
	95% Adjusted-CLT UCL	0.0607		97.5% Chebyshev (MVUE) UCL	0.0643
	95% Modified-t UCL	0.055		99% Chebyshev (MVUE) UCL	0.0792
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	3.785	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.0108			
	nu star	121.1			
	Approximate Chi Square Value (.05)	96.71	Nonparametric Statistics		
	Adjusted Level of Significance	0.0335		95% CLT UCL	0.053
	Adjusted Chi Square Value	94.23		95% Jackknife UCL	0.0538
				95% Standard Bootstrap UCL	0.0527
	Anderson-Darling Test Statistic	3.16		95% Bootstrap-t UCL	0.108
	Anderson-Darling 5% Critical Value	0.742		95% Hall's Bootstrap UCL	0.0974
	Kolmogorov-Smirnov Test Statistic	0.345		95% Percentile Bootstrap UCL	0.0553
	Kolmogorov-Smirnov 5% Critical Value	0.216		95% BCA Bootstrap UCL	0.0628
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0732
				97.5% Chebyshev(Mean, Sd) UCL	0.0872
				99% Chebyshev(Mean, Sd) UCL	0.115
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	0.0511			
	95% Adjusted Gamma UCL	0.0524			
Potential UCL to Use				Use 95% Student's-t UCL	0.0538
				or 95% Modified-t UCL	0.055

Result or 1/2 SDL (4,4'-ddt)

General Statistics					
	Number of Valid Samples	17		Number of Unique Samples	15
Raw Statistics			Log-transformed Statistics		
	Minimum	8.8500E-5		Minimum of Log Data	-9.333
	Maximum	0.0033		Maximum of Log Data	-5.708
	Mean	4.1103E-4		Mean of log Data	-8.608

Median	1.0250E-4	SD of log Data	1.086
SD	7.9620E-4		
Coefficient of Variation	1.937		
Skewness	3.45		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.467	Shapiro Wilk Test Statistic	0.714
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.4817E-4	95% H-UCL	7.0721E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.1445E-4
95% Adjusted-CLT UCL	9.0131E-4	97.5% Chebyshev (MVUE) UCL	8.8812E-4
95% Modified-t UCL	7.7510E-4	99% Chebyshev (MVUE) UCL	0.0012
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.648	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.3401E-4		
nu star	22.04		
Approximate Chi Square Value (.05)	12.37	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	7.2866E-4
Adjusted Chi Square Value	11.61	95% Jackknife UCL	7.4817E-4
		95% Standard Bootstrap UCL	7.1836E-4
Anderson-Darling Test Statistic	2.621	95% Bootstrap-t UCL	0.0018
Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	0.0018
Kolmogorov-Smirnov Test Statistic	0.375	95% Percentile Bootstrap UCL	7.5694E-4
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	9.4576E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0012
		97.5% Chebyshev(Mean, Sd) UCL	0.0016
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0023
95% Approximate Gamma UCL	7.3242E-4		
95% Adjusted Gamma UCL	7.8005E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0023

Result or 1/2 SDL (4,6-dinitro-2-methylphenol)

General Statistics

Number of Valid Samples		16	Number of Unique Samples		15
Raw Statistics			Log-transformed Statistics		
Minimum	0.0123		Minimum of Log Data	-4.402	
Maximum	0.0627		Maximum of Log Data	-2.769	
Mean	0.017		Mean of log Data	-4.186	
Median	0.0132		SD of log Data	0.399	
SD	0.0123				
Coefficient of Variation	0.725				
Skewness	3.843				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.396	Shapiro Wilk Test Statistic	0.542
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0224	95% H-UCL	0.0201
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0237
95% Adjusted-CLT UCL	0.0252	97.5% Chebyshev (MVUE) UCL	0.0268
95% Modified-t UCL	0.0229	99% Chebyshev (MVUE) UCL	0.033
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.812	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0044		
nu star	122		
Approximate Chi Square Value (.05)	97.49	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0221
Adjusted Chi Square Value	95	95% Jackknife UCL	0.0224
		95% Standard Bootstrap UCL	0.022
Anderson-Darling Test Statistic	3.154	95% Bootstrap-t UCL	0.0447
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.0405
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	0.023
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0264
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0304
		97.5% Chebyshev(Mean, Sd) UCL	0.0363
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0477
95% Approximate Gamma UCL	0.0213		
95% Adjusted Gamma UCL	0.0218		
Potential UCL to Use		Use 95% Student's-t UCL	0.0224
		or 95% Modified-t UCL	0.0229

Result or 1/2 SDL (acenaphthene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0061	Minimum of Log Data	-5.099
Maximum	0.0631	Maximum of Log Data	-2.763
Mean	0.0116	Mean of log Data	-4.757
Median	0.0067	SD of log Data	0.628
SD	0.0144		
Coefficient of Variation	1.248		
Skewness	3.498		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.423	Shapiro Wilk Test Statistic	0.58
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887

Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0179		95% H-UCL		0.0149	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0177	
95% Adjusted-CLT UCL		0.0208		97.5% Chebyshev (MVUE) UCL		0.0209	
95% Modified-t UCL		0.0184		99% Chebyshev (MVUE) UCL		0.0272	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		1.535		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0075					
nu star		49.11					
Approximate Chi Square Value (.05)		34.02		Nonparametric Statistics			
Adjusted Level of Significance		0.0335		95% CLT UCL		0.0175	
Adjusted Chi Square Value		32.6		95% Jackknife UCL		0.0179	
				95% Standard Bootstrap UCL		0.0174	
Anderson-Darling Test Statistic		3.332		95% Bootstrap-t UCL		0.0819	
Anderson-Darling 5% Critical Value		0.752		95% Hall's Bootstrap UCL		0.0483	
Kolmogorov-Smirnov Test Statistic		0.415		95% Percentile Bootstrap UCL		0.0177	
Kolmogorov-Smirnov 5% Critical Value		0.218		95% BCA Bootstrap UCL		0.0211	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0273	
				97.5% Chebyshev(Mean, Sd) UCL		0.034	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0474	
95% Approximate Gamma UCL		0.0167					
95% Adjusted Gamma UCL		0.0174					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.0273	

Result or 1/2 SDL (aluminum)

General Statistics			
Number of Valid Samples		16	
Number of Unique Samples		16	
Raw Statistics		Log-transformed Statistics	
Minimum	3900	Minimum of Log Data	8.269
Maximum	12500	Maximum of Log Data	9.433
Mean	6854	Mean of log Data	8.781
Median	6345	SD of log Data	0.331
SD	2346		
Coefficient of Variation	0.342		
Skewness	0.876		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7882	95% H-UCL	8081
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9351

95% Adjusted-CLT UCL	7956	97.5% Chebyshev (MVUE) UCL	10434
95% Modified-t UCL	7904	99% Chebyshev (MVUE) UCL	12562
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.977	Data appear Normal at 5% Significance Level	
Theta Star	859.3		
nu star	255.3		
Approximate Chi Square Value (.05)	219.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	7819
Adjusted Chi Square Value	215.5	95% Jackknife UCL	7882
		95% Standard Bootstrap UCL	7774
Anderson-Darling Test Statistic	0.237	95% Bootstrap-t UCL	8066
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	8093
Kolmogorov-Smirnov Test Statistic	0.116	95% Percentile Bootstrap UCL	7798
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	7883
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9411
		97.5% Chebyshev(Mean, Sd) UCL	10517
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12689
95% Approximate Gamma UCL	7980		
95% Adjusted Gamma UCL	8120		
Potential UCL to Use		Use 95% Student's-t UCL	7882

Result or 1/2 SDL (anthracene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0067	Minimum of Log Data	-5.006
Maximum	0.0753	Maximum of Log Data	-2.586
Mean	0.0201	Mean of log Data	-4.283
Median	0.0089	SD of log Data	0.838
SD	0.0205		
Coefficient of Variation	1.017		
Skewness	1.776		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.711	Shapiro Wilk Test Statistic	0.805
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0291	95% H-UCL	0.0335
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0378
95% Adjusted-CLT UCL	0.0309	97.5% Chebyshev (MVUE) UCL	0.0459
95% Modified-t UCL	0.0294	99% Chebyshev (MVUE) UCL	0.0619
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.24	Data do not follow a Discernable Distribution (0.05)	

Theta Star	0.0162		
nu star	39.69		
Approximate Chi Square Value (.05)	26.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0285
Adjusted Chi Square Value	25.02	95% Jackknife UCL	0.0291
		95% Standard Bootstrap UCL	0.0283
Anderson-Darling Test Statistic	1.546	95% Bootstrap-t UCL	0.0368
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	0.0337
Kolmogorov-Smirnov Test Statistic	0.323	95% Percentile Bootstrap UCL	0.0289
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	0.0317
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0424
		97.5% Chebyshev(Mean, Sd) UCL	0.052
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.071
95% Approximate Gamma UCL	0.0304		
95% Adjusted Gamma UCL	0.0319		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0424

Result or 1/2 SDL (antimony)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	0.74	Minimum of Log Data	-0.301
Maximum	8.14	Maximum of Log Data	2.097
Mean	2.245	Mean of log Data	0.629
Median	1.75	SD of log Data	0.57
SD	1.751		
Coefficient of Variation	0.78		
Skewness	2.813		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.675	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.012	95% H-UCL	3.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.591
95% Adjusted-CLT UCL	3.294	97.5% Chebyshev (MVUE) UCL	4.201
95% Modified-t UCL	3.064	99% Chebyshev (MVUE) UCL	5.399
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.429	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.924		
nu star	77.73		
Approximate Chi Square Value (.05)	58.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	2.965
Adjusted Chi Square Value	56.52	95% Jackknife UCL	3.012

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General Statistics

Relevant UCL Statistics

Gamma Distribution Test

Data Distribution

Approximate Chi Square Value (.05) 221.4

Nonparametric Statistics

Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		5.552
				97.5% Chebyshev(Mean, Sd) UCL		6.212
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		7.508
95% Approximate Gamma UCL		4.684				
95% Adjusted Gamma UCL		4.766				
Potential UCL to Use				Use 95% Student's-t UCL		4.64
Result or 1/2 SDL (atrazine (aatrex))						
General Statistics						
Number of Valid Samples		16	Number of Unique Samples		15	
Raw Statistics			Log-transformed Statistics			
Minimum		0.012	Minimum of Log Data		-4.423	
Maximum		0.0814	Maximum of Log Data		-2.508	
Mean		0.0179	Mean of log Data		-4.189	
Median		0.0129	SD of log Data		0.466	
SD		0.017				
Coefficient of Variation		0.951				
Skewness		3.921				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.359	Shapiro Wilk Test Statistic		0.502	
Shapiro Wilk Critical Value		0.887	Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.0254	95% H-UCL		0.0216	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0255	
95% Adjusted-CLT UCL		0.0294	97.5% Chebyshev (MVUE) UCL		0.0293	
95% Modified-t UCL		0.0261	99% Chebyshev (MVUE) UCL		0.0368	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		2.613	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0068				
nu star		83.62				
Approximate Chi Square Value (.05)		63.55	Nonparametric Statistics			
Adjusted Level of Significance		0.0335	95% CLT UCL		0.0249	
Adjusted Chi Square Value		61.56	95% Jackknife UCL		0.0254	
			95% Standard Bootstrap UCL		0.0247	
Anderson-Darling Test Statistic		3.587	95% Bootstrap-t UCL		0.0697	
Anderson-Darling 5% Critical Value		0.744	95% Hall's Bootstrap UCL		0.0528	
Kolmogorov-Smirnov Test Statistic		0.387	95% Percentile Bootstrap UCL		0.0264	
Kolmogorov-Smirnov 5% Critical Value		0.217	95% BCA Bootstrap UCL		0.0308	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0365	
			97.5% Chebyshev(Mean, Sd) UCL		0.0445	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0603	
95% Approximate Gamma UCL		0.0236				
95% Adjusted Gamma UCL		0.0243				

Potential UCL to Use								Use 95% Student's-t UCL								0.0254	
								or 95% Modified-t UCL								0.0261	
Result or 1/2 SDL (barium)																	
General Statistics																	
Number of Valid Samples				16		Number of Unique Samples				14							
Raw Statistics						Log-transformed Statistics											
		Minimum		116				Minimum of Log Data		4.754							
		Maximum		377				Maximum of Log Data		5.932							
		Mean		215.3				Mean of log Data		5.339							
		Median		198				SD of log Data		0.263							
		SD		59.65													
		Coefficient of Variation		0.277													
		Skewness		1.296													
Relevant UCL Statistics																	
Normal Distribution Test						Lognormal Distribution Test											
		Shapiro Wilk Test Statistic		0.887				Shapiro Wilk Test Statistic		0.939							
		Shapiro Wilk Critical Value		0.887				Shapiro Wilk Critical Value		0.887							
Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level											
Assuming Normal Distribution						Assuming Lognormal Distribution											
		95% Student's-t UCL		241.4				95% H-UCL		244.4							
95% UCLs (Adjusted for Skewness)								95% Chebyshev (MVUE) UCL		277.3							
		95% Adjusted-CLT UCL		244.9				97.5% Chebyshev (MVUE) UCL		304.2							
		95% Modified-t UCL		242.2				99% Chebyshev (MVUE) UCL		357.1							
Gamma Distribution Test						Data Distribution											
		k star (bias corrected)		12.47				Data appear Gamma Distributed at 5% Significance Level									
		Theta Star		17.27													
		nu star		398.9													
		Approximate Chi Square Value (.05)		353.6				Nonparametric Statistics									
		Adjusted Level of Significance		0.0335				95% CLT UCL		239.8							
		Adjusted Chi Square Value		348.8				95% Jackknife UCL		241.4							
								95% Standard Bootstrap UCL		239.4							
		Anderson-Darling Test Statistic		0.562				95% Bootstrap-t UCL		250.3							
		Anderson-Darling 5% Critical Value		0.738				95% Hall's Bootstrap UCL		261.9							
		Kolmogorov-Smirnov Test Statistic		0.17				95% Percentile Bootstrap UCL		240							
		Kolmogorov-Smirnov 5% Critical Value		0.215				95% BCA Bootstrap UCL		244.2							
Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL		280.3							
								97.5% Chebyshev(Mean, Sd) UCL		308.4							
Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL		363.6							
		95% Approximate Gamma UCL		242.8													
		95% Adjusted Gamma UCL		246.2													
Potential UCL to Use								Use 95% Approximate Gamma UCL		242.8							

Result or 1/2 SDL (benzo(a)anthracene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	14
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Raw Statistics

Log-transformed Statistics

Minimum	0.0062	Minimum of Log Data	-5.075
Maximum	0.395	Maximum of Log Data	-0.929
Mean	0.0454	Mean of log Data	-4.365
Median	0.0069	SD of log Data	1.321
SD	0.103		
Coefficient of Variation	2.258		
Skewness	3.108		

Relevant UCL Statistics

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.454	Shapiro Wilk Test Statistic	0.591
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887

Data not Normal at 5% Significance Level

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

Assuming Lognormal Distribution

95% Student's-t UCL	0.0904	95% H-UCL	0.092
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0734
95% Adjusted-CLT UCL	0.109	97.5% Chebyshev (MVUE) UCL	0.0931
95% Modified-t UCL	0.0937	99% Chebyshev (MVUE) UCL	0.132

Gamma Distribution Test

Data Distribution

k star (bias corrected)	0.447	Data do not follow a Discernable Distribution (0.05)
Theta Star	0.102	
nu star	14.31	

Approximate Chi Square Value (.05)

Nonparametric Statistics

Adjusted Level of Significance	0.0335	95% CLT UCL	0.0876
Adjusted Chi Square Value	6.203	95% Jackknife UCL	0.0904
		95% Standard Bootstrap UCL	0.0863
Anderson-Darling Test Statistic	3.576	95% Bootstrap-t UCL	0.28
Anderson-Darling 5% Critical Value	0.797	95% Hall's Bootstrap UCL	0.328
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	0.0904
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.118
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.157
		97.5% Chebyshev(Mean, Sd) UCL	0.206
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.301

95% Approximate Gamma UCL

0.0958

95% Adjusted Gamma UCL

0.105

Potential UCL to Use

Use 99% Chebyshev (Mean, Sd) UCL

0.301

Result or 1/2 SDL (benzo(a)pyrene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15
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Raw Statistics			Log-transformed Statistics		
	Minimum	0.0062		Minimum of Log Data	-5.083
	Maximum	0.445		Maximum of Log Data	-0.81
	Mean	0.0661		Mean of log Data	-3.88
	Median	0.0078		SD of log Data	1.521
	SD	0.115			
	Coefficient of Variation	1.737			
	Skewness	2.722			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.598		Shapiro Wilk Test Statistic	0.764
	Shapiro Wilk Critical Value	0.887		Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.116		95% H-UCL	0.27
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.168
	95% Adjusted-CLT UCL	0.134		97.5% Chebyshev (MVUE) UCL	0.215
	95% Modified-t UCL	0.12		99% Chebyshev (MVUE) UCL	0.309
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.48	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.138			
	nu star	15.36			
	Approximate Chi Square Value (.05)	7.512	Nonparametric Statistics		
	Adjusted Level of Significance	0.0335		95% CLT UCL	0.113
	Adjusted Chi Square Value	6.895		95% Jackknife UCL	0.116
				95% Standard Bootstrap UCL	0.113
	Anderson-Darling Test Statistic	1.831		95% Bootstrap-t UCL	0.184
	Anderson-Darling 5% Critical Value	0.793		95% Hall's Bootstrap UCL	0.279
	Kolmogorov-Smirnov Test Statistic	0.36		95% Percentile Bootstrap UCL	0.117
	Kolmogorov-Smirnov 5% Critical Value	0.227		95% BCA Bootstrap UCL	0.144
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.191
				97.5% Chebyshev(Mean, Sd) UCL	0.245
				99% Chebyshev(Mean, Sd) UCL	0.352
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	0.135			
	95% Adjusted Gamma UCL	0.147			
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL	0.352

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics					
	Number of Valid Samples	16		Number of Unique Samples	16
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0043		Minimum of Log Data	-5.443
	Maximum	0.611		Maximum of Log Data	-0.493
	Mean	0.1		Mean of log Data	-3.526
	Median	0.0371		SD of log Data	1.76

SD	0.157		
Coefficient of Variation	1.565		
Skewness	2.573		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.66	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.169	95% H-UCL	0.867
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.367
95% Adjusted-CLT UCL	0.192	97.5% Chebyshev (MVUE) UCL	0.476
95% Modified-t UCL	0.173	99% Chebyshev (MVUE) UCL	0.692
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.461	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.218		
nu star	14.74		
Approximate Chi Square Value (.05)	7.082	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.165
Adjusted Chi Square Value	6.485	95% Jackknife UCL	0.169
		95% Standard Bootstrap UCL	0.164
Anderson-Darling Test Statistic	0.881	95% Bootstrap-t UCL	0.234
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	0.418
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	0.169
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.193
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.271
		97.5% Chebyshev(Mean, Sd) UCL	0.345
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.491
95% Approximate Gamma UCL	0.209		
95% Adjusted Gamma UCL	0.228		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.491

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics

Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0062	Minimum of Log Data	-5.083
Maximum	0.442	Maximum of Log Data	-0.816
Mean	0.0661	Mean of log Data	-3.851
Median	0.0086	SD of log Data	1.48
SD	0.117		
Coefficient of Variation	1.766		
Skewness	2.643		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.594		Shapiro Wilk Test Statistic		0.805	
Shapiro Wilk Critical Value		0.887		Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.117		95% H-UCL		0.244	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.161	
95% Adjusted-CLT UCL		0.135		97.5% Chebyshev (MVUE) UCL		0.206	
95% Modified-t UCL		0.121		99% Chebyshev (MVUE) UCL		0.294	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.49		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.135					
nu star		15.66					
Approximate Chi Square Value (.05)		7.726		Nonparametric Statistics			
Adjusted Level of Significance		0.0335		95% CLT UCL		0.114	
Adjusted Chi Square Value		7.099		95% Jackknife UCL		0.117	
				95% Standard Bootstrap UCL		0.112	
Anderson-Darling Test Statistic		1.602		95% Bootstrap-t UCL		0.217	
Anderson-Darling 5% Critical Value		0.792		95% Hall's Bootstrap UCL		0.304	
Kolmogorov-Smirnov Test Statistic		0.303		95% Percentile Bootstrap UCL		0.117	
Kolmogorov-Smirnov 5% Critical Value		0.226		95% BCA Bootstrap UCL		0.142	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.193	
				97.5% Chebyshev(Mean, Sd) UCL		0.248	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.357	
95% Approximate Gamma UCL		0.134					
95% Adjusted Gamma UCL		0.146					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.357	
Result or 1/2 SDL (benzo(k)fluoranthene)							
General Statistics							
Number of Valid Samples		16		Number of Unique Samples		15	
Raw Statistics				Log-transformed Statistics			
Minimum		0.0095		Minimum of Log Data		-4.651	
Maximum		0.318		Maximum of Log Data		-1.146	
Mean		0.0589		Mean of log Data		-3.644	
Median		0.0122		SD of log Data		1.253	
SD		0.0853					
Coefficient of Variation		1.447					
Skewness		2.204					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.659		Shapiro Wilk Test Statistic		0.773	
Shapiro Wilk Critical Value		0.887		Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0963		95% H-UCL		0.157	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.135	
95% Adjusted-CLT UCL		0.107		97.5% Chebyshev (MVUE) UCL		0.17	
95% Modified-t UCL		0.0983		99% Chebyshev (MVUE) UCL		0.24	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.641		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0919					
nu star		20.52					
Approximate Chi Square Value (.05)		11.24		Nonparametric Statistics			
Adjusted Level of Significance		0.0335		95% CLT UCL		0.094	
Adjusted Chi Square Value		10.46		95% Jackknife UCL		0.0963	
				95% Standard Bootstrap UCL		0.0921	
Anderson-Darling Test Statistic		1.775		95% Bootstrap-t UCL		0.129	
Anderson-Darling 5% Critical Value		0.776		95% Hall's Bootstrap UCL		0.122	
Kolmogorov-Smirnov Test Statistic		0.35		95% Percentile Bootstrap UCL		0.0958	
Kolmogorov-Smirnov 5% Critical Value		0.223		95% BCA Bootstrap UCL		0.108	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.152	
				97.5% Chebyshev(Mean, Sd) UCL		0.192	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.271	
95% Approximate Gamma UCL		0.108					
95% Adjusted Gamma UCL		0.116					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.271	

Result or 1/2 SDL (beryllium)

General Statistics			
Number of Valid Samples		16	Number of Unique Samples 12
Raw Statistics		Log-transformed Statistics	
Minimum	0.29	Minimum of Log Data	-1.238
Maximum	0.82	Maximum of Log Data	-0.198
Mean	0.463	Mean of log Data	-0.815
Median	0.42	SD of log Data	0.307
SD	0.149		
Coefficient of Variation	0.322		
Skewness	0.894		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		95% H-UCL	0.539
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.619
95% Adjusted-CLT UCL		97.5% Chebyshev (MVUE) UCL	0.687
95% Modified-t UCL		99% Chebyshev (MVUE) UCL	0.821

Gamma Distribution Test				Data Distribution			
k star (bias corrected)		9.119		Data appear Normal at 5% Significance Level			
Theta Star		0.0508					
nu star		291.8					
Approximate Chi Square Value (.05)		253.2		Nonparametric Statistics			
Adjusted Level of Significance		0.0335		95% CLT UCL		0.524	
Adjusted Chi Square Value		249.2		95% Jackknife UCL		0.528	
				95% Standard Bootstrap UCL		0.523	
Anderson-Darling Test Statistic		0.452		95% Bootstrap-t UCL		0.541	
Anderson-Darling 5% Critical Value		0.739		95% Hall's Bootstrap UCL		0.541	
Kolmogorov-Smirnov Test Statistic		0.161		95% Percentile Bootstrap UCL		0.523	
Kolmogorov-Smirnov 5% Critical Value		0.215		95% BCA Bootstrap UCL		0.532	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.625	
				97.5% Chebyshev(Mean, Sd) UCL		0.696	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.834	
95% Approximate Gamma UCL		0.534					
95% Adjusted Gamma UCL		0.542					
Potential UCL to Use				Use 95% Student's-t UCL		0.528	
Result or 1/2 SDL (boron)							
General Statistics							
Number of Valid Samples		16		Number of Unique Samples		16	
Raw Statistics				Log-transformed Statistics			
Minimum		0.675		Minimum of Log Data		-0.393	
Maximum		27.2		Maximum of Log Data		3.303	
Mean		12.04		Mean of log Data		1.699	
Median		13.45		SD of log Data		1.616	
SD		9.92					
Coefficient of Variation		0.824					
Skewness		-0.0194					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.856		Shapiro Wilk Test Statistic		0.735	
Shapiro Wilk Critical Value		0.887		Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		16.39		95% H-UCL		97.34	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		52.5	
95% Adjusted-CLT UCL		16.11		97.5% Chebyshev (MVUE) UCL		67.76	
95% Modified-t UCL		16.39		99% Chebyshev (MVUE) UCL		97.73	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.657		Data do not follow a Discernable Distribution (0.05)			
Theta Star		18.32					
nu star		21.03					

Approximate Chi Square Value (.05)	11.62	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	16.12
Adjusted Chi Square Value	10.83	95% Jackknife UCL	16.39
		95% Standard Bootstrap UCL	16.06
Anderson-Darling Test Statistic	1.705	95% Bootstrap-t UCL	16.58
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	16.03
Kolmogorov-Smirnov Test Statistic	0.288	95% Percentile Bootstrap UCL	15.89
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	15.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.85
		97.5% Chebyshev(Mean, Sd) UCL	27.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	36.72
95% Approximate Gamma UCL	21.81		
95% Adjusted Gamma UCL	23.4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	36.72
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (butyl benzyl phthalate)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0076	Minimum of Log Data	-4.873
Maximum	0.202	Maximum of Log Data	-1.599
Mean	0.0208	Mean of log Data	-4.553
Median	0.0082	SD of log Data	0.798
SD	0.0483		
Coefficient of Variation	2.323		
Skewness	3.996		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.292	Shapiro Wilk Test Statistic	0.405
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.042	95% H-UCL	0.0238
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0273
95% Adjusted-CLT UCL	0.0536	97.5% Chebyshev (MVUE) UCL	0.033
95% Modified-t UCL	0.044	99% Chebyshev (MVUE) UCL	0.0442
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.743	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.028		
nu star	23.78		
Approximate Chi Square Value (.05)	13.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0407
Adjusted Chi Square Value	12.82	95% Jackknife UCL	0.042
		95% Standard Bootstrap UCL	0.0398

Anderson-Darling Test Statistic	4.868	95% Bootstrap-t UCL	0.642
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	0.369
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	0.0449
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.0575
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0735
		97.5% Chebyshev(Mean, Sd) UCL	0.0963
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.141
95% Approximate Gamma UCL	0.0362		
95% Adjusted Gamma UCL	0.0386		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0735

Result or 1/2 SDL (carbazole)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0060	Minimum of Log Data	-5.108
Maximum	0.0861	Maximum of Log Data	-2.452
Mean	0.0151	Mean of log Data	-4.632
Median	0.0069	SD of log Data	0.79
SD	0.0214		
Coefficient of Variation	1.413		
Skewness	2.948		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.49	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0245	95% H-UCL	0.0217
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0249
95% Adjusted-CLT UCL	0.0281	97.5% Chebyshev (MVUE) UCL	0.0301
95% Modified-t UCL	0.0252	99% Chebyshev (MVUE) UCL	0.0402

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.076	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0141		
nu star	34.44		
Approximate Chi Square Value (.05)	22.01	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0239
Adjusted Chi Square Value	20.89	95% Jackknife UCL	0.0245
		95% Standard Bootstrap UCL	0.0235
Anderson-Darling Test Statistic	3.042	95% Bootstrap-t UCL	0.0644
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	0.0724
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	0.0249
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	0.0304
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0384

				97.5% Chebyshev(Mean, Sd) UCL			
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL			
95% Approximate Gamma UCL		0.0237					
95% Adjusted Gamma UCL		0.025					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL			

Result or 1/2 SDL (chloroform)

General Statistics					
Number of Valid Samples		16	Number of Unique Samples		15
Raw Statistics			Log-transformed Statistics		
Minimum	1.1400E-4		Minimum of Log Data	-9.079	
Maximum	0.0052		Maximum of Log Data	-5.246	
Mean	9.0178E-4		Mean of log Data	-7.93	
Median	2.2100E-4		SD of log Data	1.189	
SD	0.0016				
Coefficient of Variation	1.851				
Skewness	2.462				

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.486		Shapiro Wilk Test Statistic	0.796	
Shapiro Wilk Critical Value	0.887		Shapiro Wilk Critical Value	0.887	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.0016		95% H-UCL	0.0018	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.0016	
95% Adjusted-CLT UCL	0.0018		97.5% Chebyshev (MVUE) UCL	0.0021	
95% Modified-t UCL	0.0016		99% Chebyshev (MVUE) UCL	0.0029	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.58		Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0015				
nu star	18.56				
Approximate Chi Square Value (.05)	9.799		Nonparametric Statistics		
Adjusted Level of Significance	0.0335		95% CLT UCL	0.0015	
Adjusted Chi Square Value	9.081		95% Jackknife UCL	0.0016	
			95% Standard Bootstrap UCL	0.0015	
Anderson-Darling Test Statistic	2.224		95% Bootstrap-t UCL	0.0066	
Anderson-Darling 5% Critical Value	0.782		95% Hall's Bootstrap UCL	0.0061	
Kolmogorov-Smirnov Test Statistic	0.358		95% Percentile Bootstrap UCL	0.0015	
Kolmogorov-Smirnov 5% Critical Value	0.225		95% BCA Bootstrap UCL	0.0018	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0027	
			97.5% Chebyshev(Mean, Sd) UCL	0.0035	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0050	
95% Approximate Gamma UCL	0.0017				
95% Adjusted Gamma UCL	0.0018				

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL		0.0050
Result or 1/2 SDL (chromium)				
General Statistics				
Number of Valid Samples		16	Number of Unique Samples 15	
Raw Statistics		Log-transformed Statistics		
Minimum	5.01	Minimum of Log Data	1.611	
Maximum	14.4	Maximum of Log Data	2.667	
Mean	9.214	Mean of log Data	2.177	
Median	10.19	SD of log Data	0.314	
SD	2.644			
Coefficient of Variation	0.287			
Skewness	-0.17			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.873	
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887	
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	10.37	95% H-UCL	10.8	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.44	
95% Adjusted-CLT UCL	10.27	97.5% Chebyshev (MVUE) UCL	13.83	
95% Modified-t UCL	10.37	99% Chebyshev (MVUE) UCL	16.55	
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	9.542	Data appear Normal at 5% Significance Level		
Theta Star	0.966			
nu star	305.3			
Approximate Chi Square Value (.05)	265.9	Nonparametric Statistics		
Adjusted Level of Significance	0.0335	95% CLT UCL	10.3	
Adjusted Chi Square Value	261.7	95% Jackknife UCL	10.37	
		95% Standard Bootstrap UCL	10.24	
Anderson-Darling Test Statistic	0.99	95% Bootstrap-t UCL	10.32	
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	10.26	
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	10.21	
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	10.2	
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.09	
		97.5% Chebyshev(Mean, Sd) UCL	13.34	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.79	
95% Approximate Gamma UCL	10.58			
95% Adjusted Gamma UCL	10.75			
Potential UCL to Use		Use 95% Student's-t UCL		10.37
Result or 1/2 SDL (chrysene)				

General Statistics			
Number of Valid Samples		16	Number of Unique Samples
			15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0054	Minimum of Log Data	-5.212
Maximum	0.475	Maximum of Log Data	-0.744
Mean	0.0774	Mean of log Data	-3.614
Median	0.0177	SD of log Data	1.522
SD	0.123		
Coefficient of Variation	1.585		
Skewness	2.577		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.649	Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.131	95% H-UCL	0.353
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.219
95% Adjusted-CLT UCL	0.149	97.5% Chebyshev (MVUE) UCL	0.281
95% Modified-t UCL	0.134	99% Chebyshev (MVUE) UCL	0.404
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.519	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.149		
nu star	16.62		
Approximate Chi Square Value (.05)	8.399	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.128
Adjusted Chi Square Value	7.741	95% Jackknife UCL	0.131
		95% Standard Bootstrap UCL	0.125
Anderson-Darling Test Statistic	0.903	95% Bootstrap-t UCL	0.186
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	0.311
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	0.126
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	0.16
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.211
		97.5% Chebyshev(Mean, Sd) UCL	0.269
		99% Chebyshev(Mean, Sd) UCL	0.382
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.153		
95% Adjusted Gamma UCL	0.166		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.153

Result or 1/2 SDL (cobalt)

General Statistics			
Number of Valid Samples		16	Number of Unique Samples
			16
Raw Statistics		Log-transformed Statistics	
Minimum	3.05	Minimum of Log Data	1.115

Maximum	7.16	Maximum of Log Data	1.969
Mean	4.385	Mean of log Data	1.449
Median	4.06	SD of log Data	0.245
SD	1.131		
Coefficient of Variation	0.258		
Skewness	0.956		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.881	95% H-UCL	4.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.562
95% Adjusted-CLT UCL	4.922	97.5% Chebyshev (MVUE) UCL	6.073
95% Modified-t UCL	4.892	99% Chebyshev (MVUE) UCL	7.077
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.16	Data appear Normal at 5% Significance Level	
Theta Star	0.31		
nu star	453.1		
Approximate Chi Square Value (.05)	404.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	4.85
Adjusted Chi Square Value	399.6	95% Jackknife UCL	4.881
		95% Standard Bootstrap UCL	4.824
Anderson-Darling Test Statistic	0.352	95% Bootstrap-t UCL	4.955
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	4.97
Kolmogorov-Smirnov Test Statistic	0.129	95% Percentile Bootstrap UCL	4.846
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	4.865
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.618
		97.5% Chebyshev(Mean, Sd) UCL	6.151
		99% Chebyshev(Mean, Sd) UCL	7.198
Assuming Gamma Distribution			
95% Approximate Gamma UCL	4.909		
95% Adjusted Gamma UCL	4.973		
Potential UCL to Use		Use 95% Student's-t UCL	4.881

Result or 1/2 SDL (copper)

General Statistics

Number of Valid Samples		16	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum	3.28		Minimum of Log Data	1.188	
Maximum	12.6		Maximum of Log Data	2.534	
Mean	7.112		Mean of log Data	1.87	
Median	6.655		SD of log Data	0.456	
SD	2.997				
Coefficient of Variation	0.421				

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Result or 1/2 SDL (cyclohexane)

General Statistics					
Number of Valid Samples		16	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum		8.9500E-4	Minimum of Log Data		-7.019
Maximum		0.0042	Maximum of Log Data		-5.46
Mean		0.0023	Mean of log Data		-6.214
Median		0.0017	SD of log Data		0.55
SD		0.0013			
Coefficient of Variation		0.561			
Skewness		0.694			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.793	Shapiro Wilk Test Statistic		0.872

Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0028	95% H-UCL	0.0031
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0037
95% Adjusted-CLT UCL	0.0029	97.5% Chebyshev (MVUE) UCL	0.0043
95% Modified-t UCL	0.0028	99% Chebyshev (MVUE) UCL	0.0055
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.996	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	7.7140E-4		
nu star	95.86		
Approximate Chi Square Value (.05)	74.28	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0028
Adjusted Chi Square Value	72.12	95% Jackknife UCL	0.0028
		95% Standard Bootstrap UCL	0.0028
Anderson-Darling Test Statistic	1.082	95% Bootstrap-t UCL	0.0029
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.0027
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	0.0028
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0029
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0037
		97.5% Chebyshev(Mean, Sd) UCL	0.0043
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0055
95% Approximate Gamma UCL	0.0029		
95% Adjusted Gamma UCL	0.0030		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0029

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.0059	Minimum of Log Data	-5.133
Maximum	0.235	Maximum of Log Data	-1.448
Mean	0.0435	Mean of log Data	-4.041
Median	0.0078	SD of log Data	1.342
SD	0.0649		
Coefficient of Variation	1.491		
Skewness	2.176		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.766
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0719	95% H-UCL	0.135

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.105
95% Adjusted-CLT UCL	0.0796	97.5% Chebyshev (MVUE) UCL		0.133
95% Modified-t UCL	0.0734	99% Chebyshev (MVUE) UCL		0.189
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.587	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0742			
nu star	18.77			
Approximate Chi Square Value (.05)	9.952	Nonparametric Statistics		
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0702	
Adjusted Chi Square Value	9.227	95% Jackknife UCL	0.0719	
		95% Standard Bootstrap UCL	0.0692	
Anderson-Darling Test Statistic	1.818	95% Bootstrap-t UCL	0.106	
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	0.19	
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	0.0702	
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	0.0813	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.114	
		97.5% Chebyshev(Mean, Sd) UCL	0.145	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.205	
95% Approximate Gamma UCL	0.0821			
95% Adjusted Gamma UCL	0.0885			
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.205	

Result or 1/2 SDL (dibenzofuran)

General Statistics					
Number of Valid Samples		16	Number of Unique Samples		14
Raw Statistics			Log-transformed Statistics		
Minimum		0.0086	Minimum of Log Data		-4.75
Maximum		0.0305	Maximum of Log Data		-3.49
Mean		0.0123	Mean of log Data		-4.486
Median		0.0096	SD of log Data		0.386
SD		0.0065			
Coefficient of Variation		0.534			
Skewness		2.369			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.579	Shapiro Wilk Test Statistic		0.678
Shapiro Wilk Critical Value		0.887	Shapiro Wilk Critical Value		0.887
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0152	95% H-UCL		0.0147
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0172
95% Adjusted-CLT UCL		0.016	97.5% Chebyshev (MVUE) UCL		0.0195
95% Modified-t UCL		0.0153	99% Chebyshev (MVUE) UCL		0.0239
Gamma Distribution Test			Data Distribution		

k star (bias corrected)	4.848	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0025		
nu star	155.2		
Approximate Chi Square Value (.05)	127.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.015
Adjusted Chi Square Value	124.5	95% Jackknife UCL	0.0152
		95% Standard Bootstrap UCL	0.0149
Anderson-Darling Test Statistic	2.403	95% Bootstrap-t UCL	0.0241
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	0.0298
Kolmogorov-Smirnov Test Statistic	0.304	95% Percentile Bootstrap UCL	0.015
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.0162
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0194
		97.5% Chebyshev(Mean, Sd) UCL	0.0225
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0286
95% Approximate Gamma UCL	0.015		
95% Adjusted Gamma UCL	0.0153		
Potential UCL to Use		Use 95% Student's-t UCL	0.0152
		or 95% Modified-t UCL	0.0153

Result or 1/2 SDL (diethyl phthalate)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0104	Minimum of Log Data	-4.566
Maximum	0.0389	Maximum of Log Data	-3.247
Mean	0.0135	Mean of log Data	-4.369
Median	0.0112	SD of log Data	0.326
SD	0.0069		
Coefficient of Variation	0.513		
Skewness	3.652		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.461	Shapiro Wilk Test Statistic	0.602
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0166	95% H-UCL	0.0157
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0181
95% Adjusted-CLT UCL	0.0181	97.5% Chebyshev (MVUE) UCL	0.0202
95% Modified-t UCL	0.0169	99% Chebyshev (MVUE) UCL	0.0242
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.232	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0021		
nu star	199.4		
Approximate Chi Square Value (.05)	167.8	Nonparametric Statistics	

Adjusted Level of Significance	0.0335	95% CLT UCL	0.0164
Adjusted Chi Square Value	164.5	95% Jackknife UCL	0.0166
		95% Standard Bootstrap UCL	0.0162
Anderson-Darling Test Statistic	2.57	95% Bootstrap-t UCL	0.0251
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.0261
Kolmogorov-Smirnov Test Statistic	0.283	95% Percentile Bootstrap UCL	0.0167
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0185
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0211
		97.5% Chebyshev(Mean, Sd) UCL	0.0244
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0308
95% Approximate Gamma UCL	0.0161		
95% Adjusted Gamma UCL	0.0164		
Potential UCL to Use		Use 95% Student's-t UCL	0.0166
		or 95% Modified-t UCL	0.0169

Result or 1/2 SDL (di-n-octyl phthalate)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	0.0051	Minimum of Log Data	-5.279
Maximum	0.192	Maximum of Log Data	-1.65
Mean	0.018	Mean of log Data	-4.875
Median	0.0056	SD of log Data	0.9
SD	0.0465		
Coefficient of Variation	2.577		
Skewness	3.983		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.303	Shapiro Wilk Test Statistic	0.476
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0384	95% H-UCL	0.0208
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0228
95% Adjusted-CLT UCL	0.0495	97.5% Chebyshev (MVUE) UCL	0.0279
95% Modified-t UCL	0.0403	99% Chebyshev (MVUE) UCL	0.038
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.613	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0294		
nu star	19.61		
Approximate Chi Square Value (.05)	10.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0371
Adjusted Chi Square Value	9.817	95% Jackknife UCL	0.0384
		95% Standard Bootstrap UCL	0.0368
Anderson-Darling Test Statistic	4.473	95% Bootstrap-t UCL	0.744

Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	0.313
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	0.041
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	0.0529
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0686
		97.5% Chebyshev(Mean, Sd) UCL	0.0906
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.134
95% Approximate Gamma UCL	0.0335		
95% Adjusted Gamma UCL	0.036		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0686

Result or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	0.0068	Minimum of Log Data	-4.984
Maximum	0.804	Maximum of Log Data	-0.218
Mean	0.113	Mean of log Data	-3.442
Median	0.016	SD of log Data	1.651
SD	0.201		
Coefficient of Variation	1.786		
Skewness	3.01		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.577	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.201	95% H-UCL	0.642
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.327
95% Adjusted-CLT UCL	0.236	97.5% Chebyshev (MVUE) UCL	0.423
95% Modified-t UCL	0.207	99% Chebyshev (MVUE) UCL	0.611
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.451	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.25		
nu star	14.44		
Approximate Chi Square Value (.05)	6.872	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.196
Adjusted Chi Square Value	6.285	95% Jackknife UCL	0.201
		95% Standard Bootstrap UCL	0.194
Anderson-Darling Test Statistic	1.352	95% Bootstrap-t UCL	0.306
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	0.492
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	0.201
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.236
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.332
		97.5% Chebyshev(Mean, Sd) UCL	0.427

Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.614
95% Approximate Gamma UCL		0.237				
95% Adjusted Gamma UCL		0.259				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.614	
Result or 1/2 SDL (fluorene)						
General Statistics						
Number of Valid Samples		16	Number of Unique Samples		15	
Raw Statistics			Log-transformed Statistics			
Minimum		0.006	Minimum of Log Data		-5.116	
Maximum		0.046	Maximum of Log Data		-3.079	
Mean		0.0122	Mean of log Data		-4.65	
Median		0.0073	SD of log Data		0.63	
SD		0.0111				
Coefficient of Variation		0.916				
Skewness		2.347				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.612	Shapiro Wilk Test Statistic		0.739	
Shapiro Wilk Critical Value		0.887	Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		0.017	95% H-UCL		0.0167	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0198	
95% Adjusted-CLT UCL		0.0185	97.5% Chebyshev (MVUE) UCL		0.0233	
95% Modified-t UCL		0.0173	99% Chebyshev (MVUE) UCL		0.0304	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		1.859	Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0065				
nu star		59.5				
Approximate Chi Square Value (.05)		42.76	Nonparametric Statistics			
Adjusted Level of Significance		0.0335	95% CLT UCL		0.0167	
Adjusted Chi Square Value		41.15	95% Jackknife UCL		0.017	
			95% Standard Bootstrap UCL		0.0166	
Anderson-Darling Test Statistic		2.153	95% Bootstrap-t UCL		0.022	
Anderson-Darling 5% Critical Value		0.749	95% Hall's Bootstrap UCL		0.018	
Kolmogorov-Smirnov Test Statistic		0.349	95% Percentile Bootstrap UCL		0.0169	
Kolmogorov-Smirnov 5% Critical Value		0.218	95% BCA Bootstrap UCL		0.0194	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0243	
			97.5% Chebyshev(Mean, Sd) UCL		0.0295	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0398	
95% Approximate Gamma UCL		0.0169				
95% Adjusted Gamma UCL		0.0176				
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		0.0243	

Number of Valid Samples				16	Number of Unique Samples				14
Raw Statistics					Log-transformed Statistics				
	Minimum	0.0075				Minimum of Log Data	-4.893		
	Maximum	0.0319				Maximum of Log Data	-3.445		
	Mean	0.01				Mean of log Data	-4.686		
	Median	0.0081				SD of log Data	0.355		
	SD	0.0059							
	Coefficient of Variation	0.593							
	Skewness	3.745							
Relevant UCL Statistics									
Normal Distribution Test					Lognormal Distribution Test				
	Shapiro Wilk Test Statistic	0.433				Shapiro Wilk Test Statistic	0.579		
	Shapiro Wilk Critical Value	0.887				Shapiro Wilk Critical Value	0.887		
Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution					Assuming Lognormal Distribution				
	95% Student's-t UCL	0.0126				95% H-UCL	0.0117		
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	0.0136		
	95% Adjusted-CLT UCL	0.014				97.5% Chebyshev (MVUE) UCL	0.0153		
	95% Modified-t UCL	0.0129				99% Chebyshev (MVUE) UCL	0.0186		
Gamma Distribution Test					Data Distribution				
	k star (bias corrected)	5.058			Data do not follow a Discernable Distribution (0.05)				
	Theta Star	0.0019							
	nu star	161.9							
	Approximate Chi Square Value (.05)	133.4			Nonparametric Statistics				
	Adjusted Level of Significance	0.0335				95% CLT UCL	0.0125		
	Adjusted Chi Square Value	130.5				95% Jackknife UCL	0.0126		
						95% Standard Bootstrap UCL	0.0123		
	Anderson-Darling Test Statistic	2.793				95% Bootstrap-t UCL	0.0208		
	Anderson-Darling 5% Critical Value	0.741				95% Hall's Bootstrap UCL	0.021		
	Kolmogorov-Smirnov Test Statistic	0.307				95% Percentile Bootstrap UCL	0.0128		
	Kolmogorov-Smirnov 5% Critical Value	0.216				95% BCA Bootstrap UCL	0.0146		
Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	0.0165		
Assuming Gamma Distribution						97.5% Chebyshev(Mean, Sd) UCL	0.0193		
	95% Approximate Gamma UCL	0.0122				99% Chebyshev(Mean, Sd) UCL	0.0248		
	95% Adjusted Gamma UCL	0.0124							
Potential UCL to Use						Use 95% Student's-t UCL	0.0126		
						or 95% Modified-t UCL	0.0129		

Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)

General Statistics									
Number of Valid Samples				16	Number of Unique Samples				16
Raw Statistics					Log-transformed Statistics				
	Minimum	0.0099				Minimum of Log Data	-4.615		

Maximum	0.405	Maximum of Log Data	-0.904
Mean	0.0722	Mean of log Data	-3.552
Median	0.0126	SD of log Data	1.335
SD	0.111		
Coefficient of Variation	1.532		
Skewness	2.205		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.644	Shapiro Wilk Test Statistic	0.769
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.121	95% H-UCL	0.215
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.169
95% Adjusted-CLT UCL	0.134	97.5% Chebyshev (MVUE) UCL	0.215
95% Modified-t UCL	0.123	99% Chebyshev (MVUE) UCL	0.304
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.577	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.125		
nu star	18.48		
Approximate Chi Square Value (.05)	9.738	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.118
Adjusted Chi Square Value	9.022	95% Jackknife UCL	0.121
		95% Standard Bootstrap UCL	0.117
Anderson-Darling Test Statistic	1.828	95% Bootstrap-t UCL	0.173
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	0.141
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	0.12
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.134
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.193
		97.5% Chebyshev(Mean, Sd) UCL	0.245
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.347
95% Approximate Gamma UCL	0.137		
95% Adjusted Gamma UCL	0.148		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.347

Result or 1/2 SDL (iron)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	6750	Minimum of Log Data	8.817
Maximum	28200	Maximum of Log Data	10.25
Mean	13352	Mean of log Data	9.427
Median	13200	SD of log Data	0.389
SD	5546		
Coefficient of Variation	0.415		

Skewness				1.341			
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.873		Shapiro Wilk Test Statistic		0.944	
Shapiro Wilk Critical Value		0.887		Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		15782		95% H-UCL		16280	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		19078	
95% Adjusted-CLT UCL		16129		97.5% Chebyshev (MVUE) UCL		21568	
95% Modified-t UCL		15860		99% Chebyshev (MVUE) UCL		26460	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		5.759		Data appear Gamma Distributed at 5% Significance Level			
Theta Star		2318					
nu star		184.3					
Approximate Chi Square Value (.05)		153.9		Nonparametric Statistics			
Adjusted Level of Significance		0.0335		95% CLT UCL		15632	
Adjusted Chi Square Value		150.7		95% Jackknife UCL		15782	
				95% Standard Bootstrap UCL		15544	
Anderson-Darling Test Statistic		0.495		95% Bootstrap-t UCL		16816	
Anderson-Darling 5% Critical Value		0.74		95% Hall's Bootstrap UCL		18440	
Kolmogorov-Smirnov Test Statistic		0.198		95% Percentile Bootstrap UCL		15673	
Kolmogorov-Smirnov 5% Critical Value		0.216		95% BCA Bootstrap UCL		16268	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		19395	
				97.5% Chebyshev(Mean, Sd) UCL		22010	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		27146	
95% Approximate Gamma UCL		15989					
95% Adjusted Gamma UCL		16325					
Potential UCL to Use				Use 95% Approximate Gamma UCL		15989	

Result or 1/2 SDL (isopropylbenzene (cumene))

General Statistics					
Number of Valid Samples		16	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum		1.2400E-4	Minimum of Log Data		-8.995
Maximum		0.0070	Maximum of Log Data		-4.956
Mean		0.0010	Mean of log Data		-7.845
Median		2.4000E-4	SD of log Data		1.198
SD		0.0019			
Coefficient of Variation		1.926			
Skewness		2.71			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.493	Shapiro Wilk Test Statistic		0.804

Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0018	95% H-UCL	0.0020
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0018
95% Adjusted-CLT UCL	0.0021	97.5% Chebyshev (MVUE) UCL	0.0023
95% Modified-t UCL	0.0019	99% Chebyshev (MVUE) UCL	0.0032
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.566	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	18.12		
Approximate Chi Square Value (.05)	9.479	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0018
Adjusted Chi Square Value	8.774	95% Jackknife UCL	0.0018
		95% Standard Bootstrap UCL	0.0018
Anderson-Darling Test Statistic	2.176	95% Bootstrap-t UCL	0.0081
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	0.0068
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	0.0018
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.0022
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0031
		97.5% Chebyshev(Mean, Sd) UCL	0.0040
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0058
95% Approximate Gamma UCL	0.0019		
95% Adjusted Gamma UCL	0.0020		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0058

Result or 1/2 SDL (lead)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	32.3	Maximum of Log Data	3.475
Mean	11.56	Mean of log Data	2.311
Median	10.03	SD of log Data	0.512
SD	7.161		
Coefficient of Variation	0.62		
Skewness	2.013		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.774	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.69	95% H-UCL	15.11

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		17.95
95% Adjusted-CLT UCL	15.46	97.5% Chebyshev (MVUE) UCL		20.79
95% Modified-t UCL	14.84	99% Chebyshev (MVUE) UCL		26.37
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	3.16	Data appear Gamma Distributed at 5% Significance Level		
Theta Star	3.657			
nu star	101.1			
Approximate Chi Square Value (.05)	78.92	Nonparametric Statistics		
Adjusted Level of Significance	0.0335	95% CLT UCL		14.5
Adjusted Chi Square Value	76.69	95% Jackknife UCL		14.69
		95% Standard Bootstrap UCL		14.4
Anderson-Darling Test Statistic	0.574	95% Bootstrap-t UCL		17.86
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL		31.55
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL		14.56
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL		15.63
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		19.36
		97.5% Chebyshev(Mean, Sd) UCL		22.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		29.37
95% Approximate Gamma UCL	14.81			
95% Adjusted Gamma UCL	15.24			
Potential UCL to Use		Use 95% Approximate Gamma UCL		14.81

Result or 1/2 SDL (lithium)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	20	Maximum of Log Data	2.996
Mean	10.53	Mean of log Data	2.306
Median	9.88	SD of log Data	0.314
SD	3.559		
Coefficient of Variation	0.338		
Skewness	1.247		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.894	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.09	95% H-UCL	12.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.16
95% Adjusted-CLT UCL	12.29	97.5% Chebyshev (MVUE) UCL	15.73
95% Modified-t UCL	12.14	99% Chebyshev (MVUE) UCL	18.83
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	8.624	Data appear Normal at 5% Significance Level	
Theta Star	1.221		
nu star	276		
Approximate Chi Square Value (.05)	238.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	12
Adjusted Chi Square Value	234.5	95% Jackknife UCL	12.09
		95% Standard Bootstrap UCL	11.95
Anderson-Darling Test Statistic	0.319	95% Bootstrap-t UCL	12.55
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	12.89
Kolmogorov-Smirnov Test Statistic	0.119	95% Percentile Bootstrap UCL	11.96
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	12.23
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.41
		97.5% Chebyshev(Mean, Sd) UCL	16.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.39
95% Approximate Gamma UCL	12.19		
95% Adjusted Gamma UCL	12.39		
Potential UCL to Use		Use 95% Student's-t UCL	12.09

Result or 1/2 SDL (manganese)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	192	Minimum of Log Data	5.257
Maximum	474	Maximum of Log Data	6.161
Mean	283.3	Mean of log Data	5.603
Median	275	SD of log Data	0.301
SD	87.59		
Coefficient of Variation	0.309		
Skewness	0.667		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	321.6	95% H-UCL	328.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	377.1
95% Adjusted-CLT UCL	323.2	97.5% Chebyshev (MVUE) UCL	417.8
95% Modified-t UCL	322.2	99% Chebyshev (MVUE) UCL	497.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.583	Data appear Normal at 5% Significance Level	
Theta Star	29.56		
nu star	306.7		
Approximate Chi Square Value (.05)	267.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	319.3

Adjusted Chi Square Value	262.9	95% Jackknife UCL	321.6
		95% Standard Bootstrap UCL	318.6
Anderson-Darling Test Statistic	0.707	95% Bootstrap-t UCL	324.1
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	322.7
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	319.3
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	322.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	378.7
		97.5% Chebyshev(Mean, Sd) UCL	420
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	501.1
95% Approximate Gamma UCL	325.2		
95% Adjusted Gamma UCL	330.4		
Potential UCL to Use		Use 95% Student's-t UCL	321.6

Result or 1/2 SDL (mercury)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	0.011	Minimum of Log Data	-4.51
Maximum	0.036	Maximum of Log Data	-3.324
Mean	0.0201	Mean of log Data	-3.972
Median	0.02	SD of log Data	0.367
SD	0.0073		
Coefficient of Variation	0.368		
Skewness	0.618		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0233	95% H-UCL	0.0242
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0282
95% Adjusted-CLT UCL	0.0234	97.5% Chebyshev (MVUE) UCL	0.0318
95% Modified-t UCL	0.0233	99% Chebyshev (MVUE) UCL	0.0387
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.623	Data appear Normal at 5% Significance Level	
Theta Star	0.0030		
nu star	211.9		
Approximate Chi Square Value (.05)	179.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0231
Adjusted Chi Square Value	175.8	95% Jackknife UCL	0.0233
		95% Standard Bootstrap UCL	0.023
Anderson-Darling Test Statistic	0.386	95% Bootstrap-t UCL	0.0239
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.0237
Kolmogorov-Smirnov Test Statistic	0.149	95% Percentile Bootstrap UCL	0.0229

Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.0231
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0281
		97.5% Chebyshev(Mean, Sd) UCL	0.0316
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0384
95% Approximate Gamma UCL	0.0237		
95% Adjusted Gamma UCL	0.0242		
Potential UCL to Use		Use 95% Student's-t UCL	0.0233

Result or 1/2 SDL (methylcyclohexane)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	2.9950E-4	Minimum of Log Data	-8.113
Maximum	0.0037	Maximum of Log Data	-5.599
Mean	9.5050E-4	Mean of log Data	-7.232
Median	5.8250E-4	SD of log Data	0.724
SD	8.5690E-4		
Coefficient of Variation	0.902		
Skewness	2.396		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.699	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0013	95% H-UCL	0.0014
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0016
95% Adjusted-CLT UCL	0.0014	97.5% Chebyshev (MVUE) UCL	0.0020
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	0.0026
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.649	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.7638E-4		
nu star	52.77		
Approximate Chi Square Value (.05)	37.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.0013
Adjusted Chi Square Value	35.59	95% Jackknife UCL	0.0013
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	0.885	95% Bootstrap-t UCL	0.0016
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.0027
Kolmogorov-Smirnov Test Statistic	0.208	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.0014
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0018
		97.5% Chebyshev(Mean, Sd) UCL	0.0022
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0030
95% Approximate Gamma UCL	0.0013		

95% Adjusted Gamma UCL	0.0014		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0013

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	5.66	Maximum of Log Data	1.733
Mean	0.667	Mean of log Data	-1.108
Median	0.24	SD of log Data	0.95
SD	1.358		
Coefficient of Variation	2.036		
Skewness	3.761		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.407	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.262	95% H-UCL	0.991
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.064
95% Adjusted-CLT UCL	1.566	97.5% Chebyshev (MVUE) UCL	1.308
95% Modified-t UCL	1.315	99% Chebyshev (MVUE) UCL	1.788
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.724	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.922		
nu star	23.15		
Approximate Chi Square Value (.05)	13.21	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	1.225
Adjusted Chi Square Value	12.36	95% Jackknife UCL	1.262
		95% Standard Bootstrap UCL	1.201
Anderson-Darling Test Statistic	2.348	95% Bootstrap-t UCL	4.4
Anderson-Darling 5% Critical Value	0.771	95% Hall's Bootstrap UCL	3.298
Kolmogorov-Smirnov Test Statistic	0.318	95% Percentile Bootstrap UCL	1.306
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	1.687
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.146
		97.5% Chebyshev(Mean, Sd) UCL	2.786
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.044
95% Approximate Gamma UCL	1.169		
95% Adjusted Gamma UCL	1.25		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.146

Result or 1/2 SDL (nickel)					
General Statistics					
Number of Valid Samples		16	Number of Unique Samples		15
Raw Statistics			Log-transformed Statistics		
Minimum		5.8	Minimum of Log Data		1.758
Maximum		16.7	Maximum of Log Data		2.815
Mean		9.589	Mean of log Data		2.223
Median		9.93	SD of log Data		0.283
SD		2.741			
Coefficient of Variation		0.286			
Skewness		0.821			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.899	Shapiro Wilk Test Statistic		0.926
Shapiro Wilk Critical Value		0.887	Shapiro Wilk Critical Value		0.887
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		10.79	95% H-UCL		11.02
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		12.58
95% Adjusted-CLT UCL		10.87	97.5% Chebyshev (MVUE) UCL		13.88
95% Modified-t UCL		10.81	99% Chebyshev (MVUE) UCL		16.42
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		11.02	Data appear Normal at 5% Significance Level		
Theta Star		0.87			
nu star		352.6			
Approximate Chi Square Value (.05)		310.1	Nonparametric Statistics		
Adjusted Level of Significance		0.0335	95% CLT UCL		10.72
Adjusted Chi Square Value		305.5	95% Jackknife UCL		10.79
			95% Standard Bootstrap UCL		10.7
Anderson-Darling Test Statistic		0.57	95% Bootstrap-t UCL		10.95
Anderson-Darling 5% Critical Value		0.738	95% Hall's Bootstrap UCL		11.23
Kolmogorov-Smirnov Test Statistic		0.205	95% Percentile Bootstrap UCL		10.69
Kolmogorov-Smirnov 5% Critical Value		0.215	95% BCA Bootstrap UCL		10.77
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		12.58
			97.5% Chebyshev(Mean, Sd) UCL		13.87
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		16.41
95% Approximate Gamma UCL		10.9			
95% Adjusted Gamma UCL		11.07			
Potential UCL to Use			Use 95% Student's-t UCL		10.79
Result or 1/2 SDL (n-nitrosodiphenylamine)					
General Statistics					
Number of Valid Samples		16	Number of Unique Samples		14

Raw Statistics				Log-transformed Statistics			
	Minimum	0.0069		Minimum of Log Data	-4.969		
	Maximum	0.0434		Maximum of Log Data	-3.137		
	Mean	0.0102		Mean of log Data	-4.738		
	Median	0.0075		SD of log Data	0.446		
	SD	0.0089					
	Coefficient of Variation	0.879					
	Skewness	3.902					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.369			Shapiro Wilk Test Statistic	0.514	
	Shapiro Wilk Critical Value	0.887			Shapiro Wilk Critical Value	0.887	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
	95% Student's-t UCL	0.0141			95% H-UCL	0.0122	
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	0.0144	
	95% Adjusted-CLT UCL	0.0162			97.5% Chebyshev (MVUE) UCL	0.0165	
	95% Modified-t UCL	0.0144			99% Chebyshev (MVUE) UCL	0.0205	
Gamma Distribution Test				Data Distribution			
	k star (bias corrected)	2.914		Data do not follow a Discernable Distribution (0.05)			
	Theta Star	0.0034					
	nu star	93.24					
	Approximate Chi Square Value (.05)	71.97		Nonparametric Statistics			
	Adjusted Level of Significance	0.0335			95% CLT UCL	0.0138	
	Adjusted Chi Square Value	69.85			95% Jackknife UCL	0.0141	
					95% Standard Bootstrap UCL	0.0137	
	Anderson-Darling Test Statistic	3.455			95% Bootstrap-t UCL	0.0353	
	Anderson-Darling 5% Critical Value	0.743			95% Hall's Bootstrap UCL	0.0281	
	Kolmogorov-Smirnov Test Statistic	0.374			95% Percentile Bootstrap UCL	0.0145	
	Kolmogorov-Smirnov 5% Critical Value	0.216			95% BCA Bootstrap UCL	0.017	
Data not Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL	0.0199	
					97.5% Chebyshev(Mean, Sd) UCL	0.0241	
Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL	0.0324	
	95% Approximate Gamma UCL	0.0132					
	95% Adjusted Gamma UCL	0.0136					
Potential UCL to Use					Use 95% Student's-t UCL	0.0141	
					or 95% Modified-t UCL	0.0144	

Result or 1/2 SDL (phenanthrene)

General Statistics			
	Number of Valid Samples	16	
			Number of Unique Samples
			15
Raw Statistics		Log-transformed Statistics	
	Minimum	0.0076	Minimum of Log Data
	Maximum	0.508	Maximum of Log Data
	Mean	0.0746	Mean of log Data

Median	0.021	SD of log Data	1.383
SD	0.126		
Coefficient of Variation	1.691		
Skewness	3.037		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.13	95% H-UCL	0.248
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.184
95% Adjusted-CLT UCL	0.152	97.5% Chebyshev (MVUE) UCL	0.235
95% Modified-t UCL	0.134	99% Chebyshev (MVUE) UCL	0.334
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.564	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.132		
nu star	18.03		
Approximate Chi Square Value (.05)	9.415	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.126
Adjusted Chi Square Value	8.713	95% Jackknife UCL	0.13
		95% Standard Bootstrap UCL	0.126
Anderson-Darling Test Statistic	1.118	95% Bootstrap-t UCL	0.204
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	0.315
Kolmogorov-Smirnov Test Statistic	0.267	95% Percentile Bootstrap UCL	0.133
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	0.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.212
		97.5% Chebyshev(Mean, Sd) UCL	0.272
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.388
95% Approximate Gamma UCL	0.143		
95% Adjusted Gamma UCL	0.154		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.388

Result or 1/2 SDL (pyrene)

General Statistics

Number of Valid Samples		16	Number of Unique Samples		16
Raw Statistics			Log-transformed Statistics		
Minimum	0.0073		Minimum of Log Data	-4.92	
Maximum	0.862		Maximum of Log Data	-0.149	
Mean	0.13		Mean of log Data	-3.251	
Median	0.023		SD of log Data	1.632	
SD	0.22				
Coefficient of Variation	1.697				
Skewness	2.746				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.869
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.227	95% H-UCL	0.729
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.383
95% Adjusted-CLT UCL	0.261	97.5% Chebyshev (MVUE) UCL	0.495
95% Modified-t UCL	0.233	99% Chebyshev (MVUE) UCL	0.714
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.465	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.279		
nu star	14.89		
Approximate Chi Square Value (.05)	7.184	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.221
Adjusted Chi Square Value	6.582	95% Jackknife UCL	0.227
		95% Standard Bootstrap UCL	0.218
Anderson-Darling Test Statistic	1.081	95% Bootstrap-t UCL	0.336
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	0.545
Kolmogorov-Smirnov Test Statistic	0.241	95% Percentile Bootstrap UCL	0.226
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	0.264
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.37
		97.5% Chebyshev(Mean, Sd) UCL	0.474
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.678
95% Approximate Gamma UCL	0.269		
95% Adjusted Gamma UCL	0.294		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.678

Result or 1/2 SDL (silver)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.0335	Minimum of Log Data	-3.396
Maximum	0.54	Maximum of Log Data	-0.616
Mean	0.172	Mean of log Data	-2.392
Median	0.0448	SD of log Data	1.164
SD	0.184		
Coefficient of Variation	1.07		
Skewness	0.821		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.731	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.252		95% H-UCL		0.44	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.409	
95% Adjusted-CLT UCL		0.257		97.5% Chebyshev (MVUE) UCL		0.512	
95% Modified-t UCL		0.254		99% Chebyshev (MVUE) UCL		0.716	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.792		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.217					
nu star		25.36					
Approximate Chi Square Value (.05)		14.88		Nonparametric Statistics			
Adjusted Level of Significance		0.0335		95% CLT UCL		0.247	
Adjusted Chi Square Value		13.98		95% Jackknife UCL		0.252	
				95% Standard Bootstrap UCL		0.247	
Anderson-Darling Test Statistic		2.15		95% Bootstrap-t UCL		0.273	
Anderson-Darling 5% Critical Value		0.767		95% Hall's Bootstrap UCL		0.245	
Kolmogorov-Smirnov Test Statistic		0.368		95% Percentile Bootstrap UCL		0.246	
Kolmogorov-Smirnov 5% Critical Value		0.222		95% BCA Bootstrap UCL		0.254	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.372	
				97.5% Chebyshev(Mean, Sd) UCL		0.459	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.629	
95% Approximate Gamma UCL		0.293					
95% Adjusted Gamma UCL		0.312					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.629	
Recommended UCL exceeds the maximum observation							
Result or 1/2 SDL (strontium)							
General Statistics							
Number of Valid Samples		16		Number of Unique Samples		15	
Raw Statistics				Log-transformed Statistics			
Minimum		32.8		Minimum of Log Data		3.49	
Maximum		81.7		Maximum of Log Data		4.403	
Mean		44.86		Mean of log Data		3.765	
Median		39.85		SD of log Data		0.274	
SD		14.43					
Coefficient of Variation		0.322					
Skewness		1.805					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.754		Shapiro Wilk Test Statistic		0.838	
Shapiro Wilk Critical Value		0.887		Shapiro Wilk Critical Value		0.887	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		51.19		95% H-UCL		51.06	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		58.14	

95% Adjusted-CLT UCL	52.54	97.5% Chebyshev (MVUE) UCL	63.96
95% Modified-t UCL	51.46	99% Chebyshev (MVUE) UCL	75.39
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.61	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.23		
nu star	339.4		
Approximate Chi Square Value (.05)	297.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	50.8
Adjusted Chi Square Value	293.2	95% Jackknife UCL	51.19
		95% Standard Bootstrap UCL	50.44
Anderson-Darling Test Statistic	1.15	95% Bootstrap-t UCL	57.32
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	81.83
Kolmogorov-Smirnov Test Statistic	0.261	95% Percentile Bootstrap UCL	50.68
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	51.96
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	60.59
		97.5% Chebyshev(Mean, Sd) UCL	67.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	80.77
95% Approximate Gamma UCL	51.14		
95% Adjusted Gamma UCL	51.92		
Potential UCL to Use		Use 95% Student's-t UCL	51.19
		or 95% Modified-t UCL	51.46

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	19.1	Minimum of Log Data	2.95
Maximum	36.6	Maximum of Log Data	3.6
Mean	25.58	Mean of log Data	3.225
Median	23.95	SD of log Data	0.186
SD	5.051		
Coefficient of Variation	0.198		
Skewness	1.084		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27.79	95% H-UCL	27.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.76
95% Adjusted-CLT UCL	28.02	97.5% Chebyshev (MVUE) UCL	33
95% Modified-t UCL	27.85	99% Chebyshev (MVUE) UCL	37.42

Gamma Distribution Test		Data Distribution	
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k star (bias corrected)				24.34		Data appear Normal at 5% Significance Level										
Theta Star				1.051												
nu star				778.8												
Approximate Chi Square Value (.05)				715.1		Nonparametric Statistics										
Adjusted Level of Significance				0.0335		95% CLT UCL										27.65
Adjusted Chi Square Value				708.1		95% Jackknife UCL										27.79
						95% Standard Bootstrap UCL										27.65
Anderson-Darling Test Statistic				0.584		95% Bootstrap-t UCL										28.45
Anderson-Darling 5% Critical Value				0.736		95% Hall's Bootstrap UCL										28.66
Kolmogorov-Smirnov Test Statistic				0.202		95% Percentile Bootstrap UCL										27.66
Kolmogorov-Smirnov 5% Critical Value				0.215		95% BCA Bootstrap UCL										27.93
Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL										31.08
						97.5% Chebyshev(Mean, Sd) UCL										33.46
Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL										38.14
95% Approximate Gamma UCL				27.86												
95% Adjusted Gamma UCL				28.13												
Potential UCL to Use						Use 95% Student's-t UCL										27.79
Result or 1/2 SDL (toluene)																
General Statistics																
Number of Valid Samples				16		Number of Unique Samples				16						
Raw Statistics						Log-transformed Statistics										
Minimum				4.4500E-4		Minimum of Log Data				-7.717						
Maximum				0.0058		Maximum of Log Data				-5.148						
Mean				0.0014		Mean of log Data				-6.833						
Median				8.6250E-4		SD of log Data				0.733						
SD				0.0013												
Coefficient of Variation				0.937												
Skewness				2.533												
Relevant UCL Statistics																
Normal Distribution Test						Lognormal Distribution Test										
Shapiro Wilk Test Statistic				0.679		Shapiro Wilk Test Statistic				0.896						
Shapiro Wilk Critical Value				0.887		Shapiro Wilk Critical Value				0.887						
Data not Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level										
Assuming Normal Distribution						Assuming Lognormal Distribution										
95% Student's-t UCL				0.0020		95% H-UCL				0.0021						
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL				0.0025						
95% Adjusted-CLT UCL				0.0022		97.5% Chebyshev (MVUE) UCL				0.0030						
95% Modified-t UCL				0.0020		99% Chebyshev (MVUE) UCL				0.0040						
Gamma Distribution Test						Data Distribution										
k star (bias corrected)				1.593		Data Follow Appr. Gamma Distribution at 5% Significance Level										
Theta Star				8.9869E-4												
nu star				50.99												
Approximate Chi Square Value (.05)				35.59		Nonparametric Statistics										
Adjusted Level of Significance				0.0335		95% CLT UCL				0.0019						

Adjusted Chi Square Value	34.13	95% Jackknife UCL	0.0020
		95% Standard Bootstrap UCL	0.0019
Anderson-Darling Test Statistic	0.909	95% Bootstrap-t UCL	0.0025
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	0.0041
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	0.0019
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	0.0022
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0028
		97.5% Chebyshev(Mean, Sd) UCL	0.0035
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0047
95% Approximate Gamma UCL	0.0020		
95% Adjusted Gamma UCL	0.0021		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0020

Result or 1/2 SDL (vanadium)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	9.06	Minimum of Log Data	2.204
Maximum	21.2	Maximum of Log Data	3.054
Mean	13.86	Mean of log Data	2.599
Median	13.45	SD of log Data	0.251
SD	3.523		
Coefficient of Variation	0.254		
Skewness	0.54		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.4	95% H-UCL	15.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.67
95% Adjusted-CLT UCL	15.44	97.5% Chebyshev (MVUE) UCL	19.32
95% Modified-t UCL	15.42	99% Chebyshev (MVUE) UCL	22.56
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.89	Data appear Normal at 5% Significance Level	
Theta Star	0.998		
nu star	444.4		
Approximate Chi Square Value (.05)	396.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	15.31
Adjusted Chi Square Value	391.4	95% Jackknife UCL	15.4
		95% Standard Bootstrap UCL	15.26
Anderson-Darling Test Statistic	0.338	95% Bootstrap-t UCL	15.59
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	15.42
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	15.34

Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	15.42
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.7
		97.5% Chebyshev(Mean, Sd) UCL	19.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.62
95% Approximate Gamma UCL	15.53		
95% Adjusted Gamma UCL	15.74		
Potential UCL to Use		Use 95% Student's-t UCL	15.4

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	18	Minimum of Log Data	2.89
Maximum	92.6	Maximum of Log Data	4.528
Mean	45.36	Mean of log Data	3.722
Median	43.6	SD of log Data	0.454
SD	19.88		
Coefficient of Variation	0.438		
Skewness	0.681		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.07	95% H-UCL	57.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	68.57
95% Adjusted-CLT UCL	54.44	97.5% Chebyshev (MVUE) UCL	78.56
95% Modified-t UCL	54.21	99% Chebyshev (MVUE) UCL	98.18
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.539	Data appear Normal at 5% Significance Level	
Theta Star	9.992		
nu star	145.3		
Approximate Chi Square Value (.05)	118.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	53.53
Adjusted Chi Square Value	115.7	95% Jackknife UCL	54.07
		95% Standard Bootstrap UCL	53.04
Anderson-Darling Test Statistic	0.399	95% Bootstrap-t UCL	55.53
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	55.68
Kolmogorov-Smirnov Test Statistic	0.163	95% Percentile Bootstrap UCL	53.4
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	54.04
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	67.02
		97.5% Chebyshev(Mean, Sd) UCL	76.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	94.81
95% Approximate Gamma UCL	55.64		

95% Adjusted Gamma UCL		56.97	
Potential UCL to Use			Use 95% Student's-t UCL
			54.07

APPENDIX A-7

BACKGROUND SEDIMENT INTRACOASTAL WATERWAY

								General UCL Statistics for Full Data Sets																											
User Selected Options																																			
From File								J:\1352 - Gulfco RI\risk\data queries oct 07\EPC tables with onehalf DL\ISWE data - JUST BACKGROUN																											
Full Precision								OFF																											
Confidence Coefficient								95%																											
Number of Bootstrap Operations								2000																											
Result or 1/2 SDL (1,2,4-trimethylbenzene)																																			
General Statistics																																			
Number of Valid Samples												9				Number of Unique Samples												9							
Raw Statistics												Log-transformed Statistics																							
Minimum												1.6000E-4				Minimum of Log Data												-8.74							
Maximum												0.0039				Maximum of Log Data												-5.544							
Mean												9.1039E-4				Mean of log Data												-7.594							
Median												3.6200E-4				SD of log Data												1.097							
SD												0.0012																							
Coefficient of Variation												1.33																							
Skewness												2.32																							
Relevant UCL Statistics																																			
Normal Distribution Test												Lognormal Distribution Test																							
Shapiro Wilk Test Statistic												0.677				Shapiro Wilk Test Statistic												0.913							
Shapiro Wilk Critical Value												0.829				Shapiro Wilk Critical Value												0.829							
Data not Normal at 5% Significance Level												Data appear Lognormal at 5% Significance Level																							
Assuming Normal Distribution												Assuming Lognormal Distribution																							
95% Student's-t UCL												0.0016				95% H-UCL												0.0036							
95% UCLs (Adjusted for Skewness)												95% Chebyshev (MVUE) UCL																0.0022							
95% Adjusted-CLT UCL												0.0019				97.5% Chebyshev (MVUE) UCL												0.0028							
95% Modified-t UCL												0.0017				99% Chebyshev (MVUE) UCL												0.004							
Gamma Distribution Test												Data Distribution																							
k star (bias corrected)												0.725				Data appear Gamma Distributed at 5% Significance Level																			
Theta Star												0.0012																							
nu star												13.06																							
Approximate Chi Square Value (.05)												5.932				Nonparametric Statistics																			
Adjusted Level of Significance												0.0231				95% CLT UCL												0.0015							
Adjusted Chi Square Value												4.957				95% Jackknife UCL												0.0016							
																95% Standard Bootstrap UCL												0.0015							
Anderson-Darling Test Statistic												0.564				95% Bootstrap-t UCL												0.0033							
Anderson-Darling 5% Critical Value												0.744				95% Hall's Bootstrap UCL												0.0043							
Kolmogorov-Smirnov Test Statistic												0.223				95% Percentile Bootstrap UCL												0.0015							
Kolmogorov-Smirnov 5% Critical Value												0.287				95% BCA Bootstrap UCL												0.0018							
Data appear Gamma Distributed at 5% Significance Level												95% Chebyshev(Mean, Sd) UCL																0.0026							
												97.5% Chebyshev(Mean, Sd) UCL																0.0034							
Assuming Gamma Distribution												99% Chebyshev(Mean, Sd) UCL																0.0049							
95% Approximate Gamma UCL												0.002																							
95% Adjusted Gamma UCL												0.0024																							

Potential UCL to Use		Use 95% Approximate Gamma UCL		0.002
Result or 1/2 SDL (1,4-dichlorobenzene)				
General Statistics				
Number of Valid Samples		9	Number of Unique Samples	
9				
Raw Statistics		Log-transformed Statistics		
Minimum	3.4050E-4	Minimum of Log Data	-7.985	
Maximum	0.0041	Maximum of Log Data	-5.494	
Mean	0.0014	Mean of log Data	-6.917	
Median	7.7000E-4	SD of log Data	0.947	
SD	0.0013			
Coefficient of Variation	0.936			
Skewness	1.198			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.905	
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829	
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0023	95% H-UCL	0.0045	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		
95% Adjusted-CLT UCL	0.0024	97.5% Chebyshev (MVUE) UCL	0.0044	
95% Modified-t UCL	0.0023	99% Chebyshev (MVUE) UCL	0.0061	
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.015	Data appear Gamma Distributed at 5% Significance Level		
Theta Star	0.0014			
nu star	18.26			
Approximate Chi Square Value (.05)	9.58	Nonparametric Statistics		
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0022	
Adjusted Chi Square Value	8.288	95% Jackknife UCL	0.0023	
		95% Standard Bootstrap UCL	0.0021	
Anderson-Darling Test Statistic	0.467	95% Bootstrap-t UCL	0.0031	
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	0.0030	
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	0.0022	
Kolmogorov-Smirnov 5% Critical Value	0.285	95% BCA Bootstrap UCL	0.0023	
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0034	
		97.5% Chebyshev(Mean, Sd) UCL	0.0043	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0060	
95% Approximate Gamma UCL	0.0028			
95% Adjusted Gamma UCL	0.0032			
Potential UCL to Use		Use 95% Approximate Gamma UCL		0.0028
Result or 1/2 SDL (2-butanone)				

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	2.5250E-4	Minimum of Log Data	-8.284
Maximum	0.0024	Maximum of Log Data	-6.02
Mean	0.0011	Mean of log Data	-7.04
Median	0.0011	SD of log Data	0.879
SD	8.4810E-4		
Coefficient of Variation	0.718		
Skewness	0.348		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.9
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0017	95% H-UCL	0.0033
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0028
95% Adjusted-CLT UCL	0.0016	97.5% Chebyshev (MVUE) UCL	0.0035
95% Modified-t UCL	0.0017	99% Chebyshev (MVUE) UCL	0.0048
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.288	Data appear Normal at 5% Significance Level	
Theta Star	9.1690E-4		
nu star	23.19		
Approximate Chi Square Value (.05)	13.23	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0016
Adjusted Chi Square Value	11.68	95% Jackknife UCL	0.0017
		95% Standard Bootstrap UCL	0.0016
Anderson-Darling Test Statistic	0.402	95% Bootstrap-t UCL	0.0017
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.0015
Kolmogorov-Smirnov Test Statistic	0.179	95% Percentile Bootstrap UCL	0.0016
Kolmogorov-Smirnov 5% Critical Value	0.283	95% BCA Bootstrap UCL	0.0016
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0024
		97.5% Chebyshev(Mean, Sd) UCL	0.0029
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0039
95% Approximate Gamma UCL	0.0020		
95% Adjusted Gamma UCL	0.0023		
Potential UCL to Use		Use 95% Student's-t UCL	0.0017

Result or 1/2 SDL (4,4'-ddt)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	9.1500E-5	Minimum of Log Data	-9.299

Maximum	5.7000E-4	Maximum of Log Data	-7.47
Mean	1.5550E-4	Mean of log Data	-8.988
Median	1.0450E-4	SD of log Data	0.576
SD	1.5569E-4		
Coefficient of Variation	1.001		
Skewness	2.981		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.443	Shapiro Wilk Test Statistic	0.531
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.5201E-4	95% H-UCL	2.4166E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.6745E-4
95% Adjusted-CLT UCL	2.9597E-4	97.5% Chebyshev (MVUE) UCL	3.2068E-4
95% Modified-t UCL	2.6060E-4	99% Chebyshev (MVUE) UCL	4.2525E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.697	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.1636E-5		
nu star	30.54		
Approximate Chi Square Value (.05)	18.92	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	2.4086E-4
Adjusted Chi Square Value	17.02	95% Jackknife UCL	2.5201E-4
		95% Standard Bootstrap UCL	2.3684E-4
Anderson-Darling Test Statistic	2.237	95% Bootstrap-t UCL	0.0012
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	9.1506E-4
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	2.5644E-4
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	2.6300E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.8172E-4
		97.5% Chebyshev(Mean, Sd) UCL	4.7960E-4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.7188E-4
95% Approximate Gamma UCL	2.5102E-4		
95% Adjusted Gamma UCL	2.7908E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.8172E-4

Result or 1/2 SDL (aluminum)

General Statistics			
Number of Valid Samples		9	
		Number of Unique Samples	
		9	
Raw Statistics		Log-transformed Statistics	
Minimum	4730	Minimum of Log Data	8.462
Maximum	21800	Maximum of Log Data	9.99
Mean	12213	Mean of log Data	9.255
Median	10800	SD of log Data	0.604
SD	6892		
Coefficient of Variation	0.564		

Skewness		0.403		
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.903	
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829	
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	16486	95% H-UCL	21311	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23251	
95% Adjusted-CLT UCL	16322	97.5% Chebyshev (MVUE) UCL	28003	
95% Modified-t UCL	16537	99% Chebyshev (MVUE) UCL	37338	
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	2.326	Data appear Normal at 5% Significance Level		
Theta Star	5252			
nu star	41.86			
Approximate Chi Square Value (.05)	28.03	Nonparametric Statistics		
Adjusted Level of Significance	0.0231	95% CLT UCL	15992	
Adjusted Chi Square Value	25.67	95% Jackknife UCL	16486	
		95% Standard Bootstrap UCL	15701	
Anderson-Darling Test Statistic	0.414	95% Bootstrap-t UCL	16891	
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	15366	
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	15822	
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	16030	
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22228	
		97.5% Chebyshev(Mean, Sd) UCL	26561	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	35073	
95% Approximate Gamma UCL	18240			
95% Adjusted Gamma UCL	19920			
Potential UCL to Use		Use 95% Student's-t UCL	16486	

Result or 1/2 SDL (antimony)

General Statistics					
Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum		1.68	Minimum of Log Data		0.519
Maximum		7.33	Maximum of Log Data		1.992
Mean		4.023	Mean of log Data		1.251
Median		2.83	SD of log Data		0.568
SD		2.215			
Coefficient of Variation		0.55			
Skewness		0.488			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.866	Shapiro Wilk Test Statistic		0.897

Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.396	95% H-UCL	6.669
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.407
95% Adjusted-CLT UCL	5.366	97.5% Chebyshev (MVUE) UCL	8.87
95% Modified-t UCL	5.416	99% Chebyshev (MVUE) UCL	11.74
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.544	Data appear Normal at 5% Significance Level	
Theta Star	1.581		
nu star	45.79		
Approximate Chi Square Value (.05)	31.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	5.238
Adjusted Chi Square Value	28.76	95% Jackknife UCL	5.396
		95% Standard Bootstrap UCL	5.174
Anderson-Darling Test Statistic	0.505	95% Bootstrap-t UCL	5.62
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	5.015
Kolmogorov-Smirnov Test Statistic	0.233	95% Percentile Bootstrap UCL	5.182
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	5.207
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.241
		97.5% Chebyshev(Mean, Sd) UCL	8.634
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.37
95% Approximate Gamma UCL	5.892		
95% Adjusted Gamma UCL	6.407		
Potential UCL to Use		Use 95% Student's-t UCL	5.396

Result or 1/2 SDL (arsenic)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	2.36	Minimum of Log Data	0.859
Maximum	9.62	Maximum of Log Data	2.264
Mean	5.813	Mean of log Data	1.623
Median	4.63	SD of log Data	0.566
SD	3.107		
Coefficient of Variation	0.534		
Skewness	0.351		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.739	95% H-UCL	9.637

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		10.71
95% Adjusted-CLT UCL	7.646	97.5% Chebyshev (MVUE) UCL		12.83
95% Modified-t UCL	7.759	99% Chebyshev (MVUE) UCL		16.97
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	2.603	Data appear Normal at 5% Significance Level		
Theta Star	2.233			
nu star	46.86			
Approximate Chi Square Value (.05)	32.15	Nonparametric Statistics		
Adjusted Level of Significance	0.0231	95% CLT UCL		7.517
Adjusted Chi Square Value	29.61	95% Jackknife UCL		7.739
		95% Standard Bootstrap UCL		7.435
Anderson-Darling Test Statistic	0.558	95% Bootstrap-t UCL		8.086
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL		7.147
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL		7.476
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL		7.543
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		10.33
		97.5% Chebyshev(Mean, Sd) UCL		12.28
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		16.12
95% Approximate Gamma UCL	8.473			
95% Adjusted Gamma UCL	9.202			
Potential UCL to Use		Use 95% Student's-t UCL		7.739

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	111	Minimum of Log Data	4.71
Maximum	280	Maximum of Log Data	5.635
Mean	209.7	Mean of log Data	5.318
Median	201	SD of log Data	0.263
SD	47.73		
Coefficient of Variation	0.228		
Skewness	-0.775		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	239.2	95% H-UCL	253.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	291.1
95% Adjusted-CLT UCL	231.4	97.5% Chebyshev (MVUE) UCL	326
95% Modified-t UCL	238.6	99% Chebyshev (MVUE) UCL	394.7
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	12.22	Data appear Normal at 5% Significance Level	
Theta Star	17.15		
nu star	220		
Approximate Chi Square Value (.05)	186.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	235.8
Adjusted Chi Square Value	180.2	95% Jackknife UCL	239.2
		95% Standard Bootstrap UCL	233.9
Anderson-Darling Test Statistic	0.517	95% Bootstrap-t UCL	234.2
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	233.5
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	233
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	230.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	279
		97.5% Chebyshev(Mean, Sd) UCL	309
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	368
95% Approximate Gamma UCL	247.1		
95% Adjusted Gamma UCL	256		
Potential UCL to Use		Use 95% Student's-t UCL	239.2

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.0045	Minimum of Log Data	-5.394
Maximum	0.0369	Maximum of Log Data	-3.3
Mean	0.0087	Mean of log Data	-5.045
Median	0.0054	SD of log Data	0.66
SD	0.0106		
Coefficient of Variation	1.213		
Skewness	2.99		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.429	Shapiro Wilk Test Statistic	0.512
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0153	95% H-UCL	0.0146
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0154
95% Adjusted-CLT UCL	0.0183	97.5% Chebyshev (MVUE) UCL	0.0187
95% Modified-t UCL	0.0159	99% Chebyshev (MVUE) UCL	0.0252
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.273	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0068		
nu star	22.92		
Approximate Chi Square Value (.05)	13.03	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0145

Adjusted Chi Square Value	11.49	95% Jackknife UCL	0.0153
		95% Standard Bootstrap UCL	0.0141
Anderson-Darling Test Statistic	2.375	95% Bootstrap-t UCL	0.111
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.0773
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	0.0157
Kolmogorov-Smirnov 5% Critical Value	0.283	95% BCA Bootstrap UCL	0.016
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0241
		97.5% Chebyshev(Mean, Sd) UCL	0.0307
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0438
95% Approximate Gamma UCL	0.0153		
95% Adjusted Gamma UCL	0.0174		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0241

Result or 1/2 SDL (beryllium)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	1.32	Maximum of Log Data	0.278
Mean	0.766	Mean of log Data	-0.403
Median	0.69	SD of log Data	0.566
SD	0.403		
Coefficient of Variation	0.527		
Skewness	0.315		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.016	95% H-UCL	1.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.412
95% Adjusted-CLT UCL	1.002	97.5% Chebyshev (MVUE) UCL	1.69
95% Modified-t UCL	1.018	99% Chebyshev (MVUE) UCL	2.237
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.633	Data appear Normal at 5% Significance Level	
Theta Star	0.291		
nu star	47.4		
Approximate Chi Square Value (.05)	32.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.987
Adjusted Chi Square Value	30.03	95% Jackknife UCL	1.016
		95% Standard Bootstrap UCL	0.976
Anderson-Darling Test Statistic	0.424	95% Bootstrap-t UCL	1.035
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	0.942
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	0.979

Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	0.992
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.351
		97.5% Chebyshev(Mean, Sd) UCL	1.605
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.103
95% Approximate Gamma UCL	1.113		
95% Adjusted Gamma UCL	1.208		
Potential UCL to Use		Use 95% Student's-t UCL	1.016

Result or 1/2 SDL (boron)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	13.3	Minimum of Log Data	2.588
Maximum	47.9	Maximum of Log Data	3.869
Mean	27.64	Mean of log Data	3.222
Median	26	SD of log Data	0.472
SD	12.82		
Coefficient of Variation	0.464		
Skewness	0.532		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.59	95% H-UCL	40.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.85
95% Adjusted-CLT UCL	35.48	97.5% Chebyshev (MVUE) UCL	55.15
95% Modified-t UCL	35.71	99% Chebyshev (MVUE) UCL	71.47
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.598	Data appear Normal at 5% Significance Level	
Theta Star	7.684		
nu star	64.76		
Approximate Chi Square Value (.05)	47.24	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	34.67
Adjusted Chi Square Value	44.1	95% Jackknife UCL	35.59
		95% Standard Bootstrap UCL	34.22
Anderson-Darling Test Statistic	0.301	95% Bootstrap-t UCL	37.24
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	35.13
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	34.61
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	34.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.26
		97.5% Chebyshev(Mean, Sd) UCL	54.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	70.15
95% Approximate Gamma UCL	37.89		

95% Adjusted Gamma UCL		40.59			
Potential UCL to Use			Use 95% Student's-t UCL		35.59
Result or 1/2 SDL (carbon disulfide)					
General Statistics					
Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum	8.8000E-5		Minimum of Log Data	-9.338	
Maximum	0.0084		Maximum of Log Data	-4.778	
Mean	0.0015		Mean of log Data	-7.728	
Median	4.0500E-4		SD of log Data	1.636	
SD	0.0027				
Coefficient of Variation	1.789				
Skewness	2.348				
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.612		Shapiro Wilk Test Statistic	0.888	
Shapiro Wilk Critical Value	0.829		Shapiro Wilk Critical Value	0.829	
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	0.0032		95% H-UCL	0.0283	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.0044	
95% Adjusted-CLT UCL	0.0038		97.5% Chebyshev (MVUE) UCL	0.0058	
95% Modified-t UCL	0.0034		99% Chebyshev (MVUE) UCL	0.0084	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	0.41		Data appear Gamma Distributed at 5% Significance Level		
Theta Star	0.0037				
nu star	7.375				
Approximate Chi Square Value (.05)	2.378		Nonparametric Statistics		
Adjusted Level of Significance	0.0231		95% CLT UCL	0.0030	
Adjusted Chi Square Value	1.825		95% Jackknife UCL	0.0032	
			95% Standard Bootstrap UCL	0.0030	
Anderson-Darling Test Statistic	0.768		95% Bootstrap-t UCL	0.0153	
Anderson-Darling 5% Critical Value	0.77		95% Hall's Bootstrap UCL	0.0118	
Kolmogorov-Smirnov Test Statistic	0.256		95% Percentile Bootstrap UCL	0.0031	
Kolmogorov-Smirnov 5% Critical Value	0.294		95% BCA Bootstrap UCL	0.0039	
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0055	
			97.5% Chebyshev(Mean, Sd) UCL	0.0073	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0108	
95% Approximate Gamma UCL	0.0048				
95% Adjusted Gamma UCL	0.0062				
Potential UCL to Use			Use 95% Approximate Gamma UCL	0.0048	

Result or 1/2 SDL (chromium)									
General Statistics									
Number of Valid Samples		9		Number of Unique Samples		9			
Raw Statistics				Log-transformed Statistics					
Minimum		5.81		Minimum of Log Data		1.76			
Maximum		22.5		Maximum of Log Data		3.114			
Mean		12.81		Mean of log Data		2.43			
Median		11.1		SD of log Data		0.527			
SD		6.512							
Coefficient of Variation		0.508							
Skewness		0.444							
Relevant UCL Statistics									
Normal Distribution Test				Lognormal Distribution Test					
Shapiro Wilk Test Statistic		0.89		Shapiro Wilk Test Statistic		0.911			
Shapiro Wilk Critical Value		0.829		Shapiro Wilk Critical Value		0.829			
Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level					
Assuming Normal Distribution				Assuming Lognormal Distribution					
95% Student's-t UCL		16.85		95% H-UCL		20.21			
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		22.82			
95% Adjusted-CLT UCL		16.73		97.5% Chebyshev (MVUE) UCL		27.14			
95% Modified-t UCL		16.9		99% Chebyshev (MVUE) UCL		35.62			
Gamma Distribution Test				Data Distribution					
k star (bias corrected)		2.941		Data appear Normal at 5% Significance Level					
Theta Star		4.356							
nu star		52.95							
Approximate Chi Square Value (.05)		37.23		Nonparametric Statistics					
Adjusted Level of Significance		0.0231		95% CLT UCL		16.38			
Adjusted Chi Square Value		34.47		95% Jackknife UCL		16.85			
				95% Standard Bootstrap UCL		16.18			
Anderson-Darling Test Statistic		0.391		95% Bootstrap-t UCL		17.33			
Anderson-Darling 5% Critical Value		0.724		95% Hall's Bootstrap UCL		15.96			
Kolmogorov-Smirnov Test Statistic		0.167		95% Percentile Bootstrap UCL		16.21			
Kolmogorov-Smirnov 5% Critical Value		0.28		95% BCA Bootstrap UCL		16.55			
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		22.28			
				97.5% Chebyshev(Mean, Sd) UCL		26.37			
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		34.41			
95% Approximate Gamma UCL		18.22							
95% Adjusted Gamma UCL		19.68							
Potential UCL to Use				Use 95% Student's-t UCL		16.85			
Result or 1/2 SDL (cis-1,2-dichloroethene)									
General Statistics									
Number of Valid Samples		9		Number of Unique Samples		9			

Raw Statistics				Log-transformed Statistics			
	Minimum	1.0200E-4		Minimum of Log Data	-9.191		
	Maximum	0.0284		Maximum of Log Data	-3.561		
	Mean	0.0034		Mean of log Data	-7.775		
	Median	2.3050E-4		SD of log Data	1.763		
	SD	0.0093					
	Coefficient of Variation	2.706					
	Skewness	2.995					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.415		Shapiro Wilk Test Statistic	0.777		
	Shapiro Wilk Critical Value	0.829		Shapiro Wilk Critical Value	0.829		
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
	95% Student's-t UCL	0.0092		95% H-UCL	0.0514		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.0052		
	95% Adjusted-CLT UCL	0.0119		97.5% Chebyshev (MVUE) UCL	0.0068		
	95% Modified-t UCL	0.0097		99% Chebyshev (MVUE) UCL	0.01		
Gamma Distribution Test				Data Distribution			
	k star (bias corrected)	0.29		Data do not follow a Discernable Distribution (0.05)			
	Theta Star	0.0119					
	nu star	5.211					
	Approximate Chi Square Value (.05)	1.251		Nonparametric Statistics			
	Adjusted Level of Significance	0.0231		95% CLT UCL	0.0085		
	Adjusted Chi Square Value	0.892		95% Jackknife UCL	0.0092		
				95% Standard Bootstrap UCL	0.0083		
	Anderson-Darling Test Statistic	1.687		95% Bootstrap-t UCL	0.189		
	Anderson-Darling 5% Critical Value	0.803		95% Hall's Bootstrap UCL	0.106		
	Kolmogorov-Smirnov Test Statistic	0.384		95% Percentile Bootstrap UCL	0.0096		
	Kolmogorov-Smirnov 5% Critical Value	0.301		95% BCA Bootstrap UCL	0.0128		
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.0171		
				97.5% Chebyshev(Mean, Sd) UCL	0.0229		
				99% Chebyshev(Mean, Sd) UCL	0.0345		
Assuming Gamma Distribution							
	95% Approximate Gamma UCL	0.0144					
	95% Adjusted Gamma UCL	0.0202					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL	0.0345		
Recommended UCL exceeds the maximum observation							

Result or 1/2 SDL (cobalt)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	3.32	Minimum of Log Data	1.2
Maximum	11.8	Maximum of Log Data	2.468
Mean	6.698	Mean of log Data	1.8

Median	5.92	SD of log Data	0.481
SD	3.165		
Coefficient of Variation	0.473		
Skewness	0.508		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.66	95% H-UCL	9.999
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.45
95% Adjusted-CLT UCL	8.624	97.5% Chebyshev (MVUE) UCL	13.5
95% Modified-t UCL	8.69	99% Chebyshev (MVUE) UCL	17.53
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.458	Data appear Normal at 5% Significance Level	
Theta Star	1.937		
nu star	62.24		
Approximate Chi Square Value (.05)	45.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	8.433
Adjusted Chi Square Value	42.03	95% Jackknife UCL	8.66
		95% Standard Bootstrap UCL	8.395
Anderson-Darling Test Statistic	0.361	95% Bootstrap-t UCL	9.077
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	8.427
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	8.376
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	8.624
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.3
		97.5% Chebyshev(Mean, Sd) UCL	13.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.2
95% Approximate Gamma UCL	9.245		
95% Adjusted Gamma UCL	9.918		
Potential UCL to Use		Use 95% Student's-t UCL	8.66

Result or 1/2 SDL (copper)

General Statistics

Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum	2.68		Minimum of Log Data	0.986	
Maximum	16.8		Maximum of Log Data	2.821	
Mean	8.138		Mean of log Data	1.902	
Median	6.87		SD of log Data	0.676	
SD	5.165				
Coefficient of Variation	0.635				
Skewness	0.626				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.34	95% H-UCL	15.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.4
95% Adjusted-CLT UCL	11.35	97.5% Chebyshev (MVUE) UCL	19.95
95% Modified-t UCL	11.4	99% Chebyshev (MVUE) UCL	26.94
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.895	Data appear Normal at 5% Significance Level	
Theta Star	4.294		
nu star	34.11		
Approximate Chi Square Value (.05)	21.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	10.97
Adjusted Chi Square Value	19.7	95% Jackknife UCL	11.34
		95% Standard Bootstrap UCL	10.88
Anderson-Darling Test Statistic	0.31	95% Bootstrap-t UCL	12.32
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	11.26
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	10.93
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	11.27
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.64
		97.5% Chebyshev(Mean, Sd) UCL	18.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.27
95% Approximate Gamma UCL	12.76		
95% Adjusted Gamma UCL	14.09		
Potential UCL to Use		Use 95% Student's-t UCL	11.34

Result or 1/2 SDL (iron)

General Statistics			
Number of Valid Samples		9	
		Number of Unique Samples	
		9	
Raw Statistics		Log-transformed Statistics	
Minimum	7440	Minimum of Log Data	8.915
Maximum	27900	Maximum of Log Data	10.24
Mean	16496	Mean of log Data	9.596
Median	15000	SD of log Data	0.518
SD	8097		
Coefficient of Variation	0.491		
Skewness	0.325		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		21515		95% H-UCL		25764	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		29179	
95% Adjusted-CLT UCL		21247		97.5% Chebyshev (MVUE) UCL		34648	
95% Modified-t UCL		21563		99% Chebyshev (MVUE) UCL		45392	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		3.072		Data appear Normal at 5% Significance Level			
Theta Star		5370					
nu star		55.3					
Approximate Chi Square Value (.05)		39.21		Nonparametric Statistics			
Adjusted Level of Significance		0.0231		95% CLT UCL		20935	
Adjusted Chi Square Value		36.37		95% Jackknife UCL		21515	
				95% Standard Bootstrap UCL		20682	
Anderson-Darling Test Statistic		0.415		95% Bootstrap-t UCL		22181	
Anderson-Darling 5% Critical Value		0.724		95% Hall's Bootstrap UCL		20333	
Kolmogorov-Smirnov Test Statistic		0.177		95% Percentile Bootstrap UCL		20913	
Kolmogorov-Smirnov 5% Critical Value		0.28		95% BCA Bootstrap UCL		21189	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		28260	
				97.5% Chebyshev(Mean, Sd) UCL		33351	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		43351	
95% Approximate Gamma UCL		23264					
95% Adjusted Gamma UCL		25080					
Potential UCL to Use				Use 95% Student's-t UCL		21515	

Result or 1/2 SDL (lead)

General Statistics			
Number of Valid Samples		9	
Raw Statistics			
Minimum		5.34	
Maximum		14.5	
Mean		9.587	
Median		9.2	
SD		3.603	
Coefficient of Variation		0.376	
Skewness		0.161	

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.82	95% H-UCL	13.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.14
95% Adjusted-CLT UCL	11.63	97.5% Chebyshev (MVUE) UCL	17.53

95% Modified-t UCL		11.83	99% Chebyshev (MVUE) UCL		22.23
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	5.179		Data appear Normal at 5% Significance Level		
Theta Star	1.851				
nu star	93.21				
Approximate Chi Square Value (.05)	71.95		Nonparametric Statistics		
Adjusted Level of Significance	0.0231		95% CLT UCL	11.56	
Adjusted Chi Square Value	68.02		95% Jackknife UCL	11.82	
			95% Standard Bootstrap UCL	11.48	
Anderson-Darling Test Statistic	0.417		95% Bootstrap-t UCL	12.11	
Anderson-Darling 5% Critical Value	0.722		95% Hall's Bootstrap UCL	11.28	
Kolmogorov-Smirnov Test Statistic	0.182		95% Percentile Bootstrap UCL	11.45	
Kolmogorov-Smirnov 5% Critical Value	0.28		95% BCA Bootstrap UCL	11.54	
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	14.82	
			97.5% Chebyshev(Mean, Sd) UCL	17.09	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	21.54	
95% Approximate Gamma UCL	12.42				
95% Adjusted Gamma UCL	13.14				
Potential UCL to Use			Use 95% Student's-t UCL	11.82	

Result or 1/2 SDL (lithium)

General Statistics					
Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum	7.29		Minimum of Log Data	1.987	
Maximum	44.6		Maximum of Log Data	3.798	
Mean	21.4		Mean of log Data	2.852	
Median	17.1		SD of log Data	0.697	
SD	14.41				
Coefficient of Variation	0.673				
Skewness	0.724				

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.868		Shapiro Wilk Test Statistic	0.916	
Shapiro Wilk Critical Value	0.829		Shapiro Wilk Critical Value	0.829	
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	30.33		95% H-UCL	42.41	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	43.59	
95% Adjusted-CLT UCL	30.54		97.5% Chebyshev (MVUE) UCL	53.19	
95% Modified-t UCL	30.52		99% Chebyshev (MVUE) UCL	72.04	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	1.757		Data appear Normal at 5% Significance Level		
Theta Star	12.18				

[illegible]

Result or 1/2 SDL (manganese)

General Statistics

Raw Statistics

Maximum	442	Maximum of Log Data	6.091
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Median	SD of log Data
321	0.284

Coefficient of Variation	0.269
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Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
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Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% UCLs (Adjusted for Skewness)	95% Chebyshev (MVUE) UCL	468.4
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95% UCLs (Adjusted for Skewness)

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Gamma Distribution Test

Theta Star 33.68

Theta Star

Approximate P-Value (100%)		Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% C.T.U.C.	379.5

Adjusted Chi Square Value

99% Standard Bootstrap CI: 97.9

Anderson-Darling Test Statistic	0.414	95% Bootstrap-t UCL	383.3
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	371.3
Kolmogorov-Smirnov Test Statistic	0.197	95% Percentile Bootstrap UCL	379.1
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	377.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	460
		97.5% Chebyshev(Mean, Sd) UCL	515.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	625.8
95% Approximate Gamma UCL	397.6		
95% Adjusted Gamma UCL	413.7		
Potential UCL to Use		Use 95% Student's-t UCL	385.8

Result or 1/2 SDL (mercury)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	0.05	Maximum of Log Data	-2.996
Mean	0.0176	Mean of log Data	-4.227
Median	0.016	SD of log Data	0.613
SD	0.0132		
Coefficient of Variation	0.753		
Skewness	2.163		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0258	95% H-UCL	0.0302
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0328
95% Adjusted-CLT UCL	0.0282	97.5% Chebyshev (MVUE) UCL	0.0396
95% Modified-t UCL	0.0263	99% Chebyshev (MVUE) UCL	0.0529
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.962	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0089		
nu star	35.32		
Approximate Chi Square Value (.05)	22.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.0248
Adjusted Chi Square Value	20.62	95% Jackknife UCL	0.0258
		95% Standard Bootstrap UCL	0.0244
Anderson-Darling Test Statistic	0.431	95% Bootstrap-t UCL	0.0357
Anderson-Darling 5% Critical Value	0.727	95% Hall's Bootstrap UCL	0.0574
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	0.0249
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	0.0283
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0368

		97.5% Chebyshev(Mean, Sd) UCL	0.0452
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0615
95% Approximate Gamma UCL	0.0273		
95% Adjusted Gamma UCL	0.0301		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0273

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples		9	
		Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	0.16	Minimum of Log Data	-1.833
Maximum	0.35	Maximum of Log Data	-1.05
Mean	0.241	Mean of log Data	-1.458
Median	0.24	SD of log Data	0.282
SD	0.0675		
Coefficient of Variation	0.28		
Skewness	0.35		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.283	95% H-UCL	0.296
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.34
95% Adjusted-CLT UCL	0.281	97.5% Chebyshev (MVUE) UCL	0.383
95% Modified-t UCL	0.283	99% Chebyshev (MVUE) UCL	0.468
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.681	Data appear Normal at 5% Significance Level	
Theta Star	0.0249		
nu star	174.3		
Approximate Chi Square Value (.05)	144.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.278
Adjusted Chi Square Value	139	95% Jackknife UCL	0.283
		95% Standard Bootstrap UCL	0.276
Anderson-Darling Test Statistic	0.283	95% Bootstrap-t UCL	0.292
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	0.278
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	0.276
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	0.274
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.339
		97.5% Chebyshev(Mean, Sd) UCL	0.382
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.465
95% Approximate Gamma UCL	0.29		
95% Adjusted Gamma UCL	0.302		

Potential UCL to Use				Use 95% Student's-t UCL				0.283
Result or 1/2 SDL (nickel)								
General Statistics								
Number of Valid Samples			9	Number of Unique Samples			9	
Raw Statistics				Log-transformed Statistics				
Minimum			6.31	Minimum of Log Data			1.842	
Maximum			27.3	Maximum of Log Data			3.307	
Mean			14.91	Mean of log Data			2.562	
Median			13	SD of log Data			0.571	
SD			8.111					
Coefficient of Variation			0.544					
Skewness			0.452					
Relevant UCL Statistics								
Normal Distribution Test				Lognormal Distribution Test				
Shapiro Wilk Test Statistic			0.892	Shapiro Wilk Test Statistic			0.909	
Shapiro Wilk Critical Value			0.829	Shapiro Wilk Critical Value			0.829	
Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level				
Assuming Normal Distribution				Assuming Lognormal Distribution				
95% Student's-t UCL			19.94	95% H-UCL			24.87	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			27.58	
95% Adjusted-CLT UCL			19.79	97.5% Chebyshev (MVUE) UCL			33.04	
95% Modified-t UCL			20.01	99% Chebyshev (MVUE) UCL			43.78	
Gamma Distribution Test				Data Distribution				
k star (bias corrected)			2.55	Data appear Normal at 5% Significance Level				
Theta Star			5.847					
nu star			45.91					
Approximate Chi Square Value (.05)			31.36	Nonparametric Statistics				
Adjusted Level of Significance			0.0231	95% CLT UCL			19.36	
Adjusted Chi Square Value			28.85	95% Jackknife UCL			19.94	
				95% Standard Bootstrap UCL			19.01	
Anderson-Darling Test Statistic			0.395	95% Bootstrap-t UCL			20.34	
Anderson-Darling 5% Critical Value			0.725	95% Hall's Bootstrap UCL			19.01	
Kolmogorov-Smirnov Test Statistic			0.172	95% Percentile Bootstrap UCL			19.16	
Kolmogorov-Smirnov 5% Critical Value			0.281	95% BCA Bootstrap UCL			19.24	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL			26.7	
				97.5% Chebyshev(Mean, Sd) UCL			31.8	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL			41.81	
95% Approximate Gamma UCL			21.83					
95% Adjusted Gamma UCL			23.73					
Potential UCL to Use				Use 95% Student's-t UCL				19.94

Result or 1/2 SDL (strontium)

General Statistics					
Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum		34.8	Minimum of Log Data		3.55
Maximum		87.4	Maximum of Log Data		4.47
Mean		59.17	Mean of log Data		4.015
Median		59.3	SD of log Data		0.388
SD		22.06			
Coefficient of Variation		0.373			
Skewness		0.141			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.854	Shapiro Wilk Test Statistic		0.849
Shapiro Wilk Critical Value		0.829	Shapiro Wilk Critical Value		0.829
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		72.84	95% H-UCL		80.08
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		92.89
95% Adjusted-CLT UCL		71.63	97.5% Chebyshev (MVUE) UCL		107.5
95% Modified-t UCL		72.9	99% Chebyshev (MVUE) UCL		136.1
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		5.29	Data appear Normal at 5% Significance Level		
Theta Star		11.18			
nu star		95.22			
Approximate Chi Square Value (.05)		73.71	Nonparametric Statistics		
Adjusted Level of Significance		0.0231	95% CLT UCL		71.26
Adjusted Chi Square Value		69.73	95% Jackknife UCL		72.84
			95% Standard Bootstrap UCL		70.57
Anderson-Darling Test Statistic		0.641	95% Bootstrap-t UCL		73.19
Anderson-Darling 5% Critical Value		0.722	95% Hall's Bootstrap UCL		68.52
Kolmogorov-Smirnov Test Statistic		0.247	95% Percentile Bootstrap UCL		70.6
Kolmogorov-Smirnov 5% Critical Value		0.28	95% BCA Bootstrap UCL		71.02
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		91.22
			97.5% Chebyshev(Mean, Sd) UCL		105.1
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		132.3
95% Approximate Gamma UCL		76.43			
95% Adjusted Gamma UCL		80.79			
Potential UCL to Use			Use 95% Student's-t UCL		72.84

Result or 1/2 SDL (titanium)

General Statistics					
Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum		21.1	Minimum of Log Data		3.049

Maximum	54.5	Maximum of Log Data	3.998
Mean	31.79	Mean of log Data	3.417
Median	28.6	SD of log Data	0.297
SD	10.49		
Coefficient of Variation	0.33		
Skewness	1.471		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	38.29	95% H-UCL	39.38
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	45.43
95% Adjusted-CLT UCL	39.37	97.5% Chebyshev (MVUE) UCL	51.38
95% Modified-t UCL	38.58	99% Chebyshev (MVUE) UCL	63.05
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.159	Data appear Normal at 5% Significance Level	
Theta Star	3.896		
nu star	146.9		
Approximate Chi Square Value (.05)	119.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	37.54
Adjusted Chi Square Value	114.7	95% Jackknife UCL	38.29
		95% Standard Bootstrap UCL	37.2
Anderson-Darling Test Statistic	0.42	95% Bootstrap-t UCL	44.39
Anderson-Darling 5% Critical Value	0.722	95% Hall's Bootstrap UCL	71.05
Kolmogorov-Smirnov Test Statistic	0.239	95% Percentile Bootstrap UCL	37.59
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	39.23
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	47.03
		97.5% Chebyshev(Mean, Sd) UCL	53.62
		99% Chebyshev(Mean, Sd) UCL	66.58
Assuming Gamma Distribution			
95% Approximate Gamma UCL	38.95		
95% Adjusted Gamma UCL	40.7		
Potential UCL to Use		Use 95% Student's-t UCL	38.29

Result or 1/2 SDL (trichloroethene)

General Statistics

Number of Valid Samples		9	Number of Unique Samples		9
Raw Statistics			Log-transformed Statistics		
Minimum	1.4300E-4		Minimum of Log Data	-8.853	
Maximum	0.0159		Maximum of Log Data	-4.141	
Mean	0.0021		Mean of log Data	-7.537	
Median	3.2350E-4		SD of log Data	1.495	
SD	0.0051				
Coefficient of Variation	2.351				

Shapiro Wilk Critical Value		0.829	Shapiro Wilk Critical Value		0.829
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL	25.87		95% H-UCL	29.5	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	33.92	
95% Adjusted-CLT UCL	25.73		97.5% Chebyshev (MVUE) UCL	39.86	
95% Modified-t UCL	25.95		99% Chebyshev (MVUE) UCL	51.51	
Gamma Distribution Test			Data Distribution		
k star (bias corrected)	3.758		Data appear Normal at 5% Significance Level		
Theta Star	5.378				
nu star	67.64				
Approximate Chi Square Value (.05)	49.71		Nonparametric Statistics		
Adjusted Level of Significance	0.0231		95% CLT UCL	25.22	
Adjusted Chi Square Value	46.49		95% Jackknife UCL	25.87	
			95% Standard Bootstrap UCL	25	
Anderson-Darling Test Statistic	0.366		95% Bootstrap-t UCL	26.93	
Anderson-Darling 5% Critical Value	0.723		95% Hall's Bootstrap UCL	25.05	
Kolmogorov-Smirnov Test Statistic	0.183		95% Percentile Bootstrap UCL	25.01	
Kolmogorov-Smirnov 5% Critical Value	0.28		95% BCA Bootstrap UCL	25.46	
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	33.48	
			97.5% Chebyshev(Mean, Sd) UCL	39.23	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	50.51	
95% Approximate Gamma UCL	27.5				
95% Adjusted Gamma UCL	29.41				
Potential UCL to Use			Use 95% Student's-t UCL	25.87	

Result or 1/2 SDL (xylene (total))

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	4.6250E-4	Minimum of Log Data	-7.679
Maximum	0.0044	Maximum of Log Data	-5.414
Mean	0.0017	Mean of log Data	-6.668
Median	0.0010	SD of log Data	0.863
SD	0.0014		
Coefficient of Variation	0.818		
Skewness	0.955		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.862	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0026	95% H-UCL	0.0046

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0040
95% Adjusted-CLT UCL	0.0027	97.5% Chebyshev (MVUE) UCL		0.005
95% Modified-t UCL	0.0026	99% Chebyshev (MVUE) UCL		0.0069
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.218	Data appear Normal at 5% Significance Level		
Theta Star	0.0014			
nu star	21.93			
Approximate Chi Square Value (.05)	12.29	Nonparametric Statistics		
Adjusted Level of Significance	0.0231	95% CLT UCL		0.0025
Adjusted Chi Square Value	10.79	95% Jackknife UCL		0.0026
		95% Standard Bootstrap UCL		0.0024
Anderson-Darling Test Statistic	0.43	95% Bootstrap-t UCL		0.0030
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL		0.0027
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL		0.0025
Kolmogorov-Smirnov 5% Critical Value	0.283	95% BCA Bootstrap UCL		0.0026
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0038
		97.5% Chebyshev(Mean, Sd) UCL		0.0047
		99% Chebyshev(Mean, Sd) UCL		0.0064
Assuming Gamma Distribution				
95% Approximate Gamma UCL	0.0031			
95% Adjusted Gamma UCL	0.0035			
Potential UCL to Use		Use 95% Student's-t UCL		0.0026

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples	9	Number of Unique Samples	9
Raw Statistics		Log-transformed Statistics	
Minimum	19.3	Minimum of Log Data	2.96
Maximum	54.1	Maximum of Log Data	3.991
Mean	36.04	Mean of log Data	3.515
Median	34.1	SD of log Data	0.404
SD	13.68		
Coefficient of Variation	0.379		
Skewness	0.0735		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	44.52	95% H-UCL	49.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	57.54
95% Adjusted-CLT UCL	43.66	97.5% Chebyshev (MVUE) UCL	66.8
95% Modified-t UCL	44.54	99% Chebyshev (MVUE) UCL	84.99
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	4.975	Data appear Normal at 5% Significance Level							
Theta Star	7.246								
nu star	89.54								
Approximate Chi Square Value (.05)	68.73	Nonparametric Statistics							
Adjusted Level of Significance	0.0231							95% CLT UCL	43.54
Adjusted Chi Square Value	64.89							95% Jackknife UCL	44.52
								95% Standard Bootstrap UCL	42.93
Anderson-Darling Test Statistic	0.426							95% Bootstrap-t UCL	44.54
Anderson-Darling 5% Critical Value	0.722							95% Hall's Bootstrap UCL	42.26
Kolmogorov-Smirnov Test Statistic	0.197							95% Percentile Bootstrap UCL	42.99
Kolmogorov-Smirnov 5% Critical Value	0.28							95% BCA Bootstrap UCL	43.54
Data appear Gamma Distributed at 5% Significance Level								95% Chebyshev(Mean, Sd) UCL	55.91
								97.5% Chebyshev(Mean, Sd) UCL	64.51
Assuming Gamma Distribution								99% Chebyshev(Mean, Sd) UCL	81.4
95% Approximate Gamma UCL	46.96								
95% Adjusted Gamma UCL	49.74								
Potential UCL to Use								Use 95% Student's-t UCL	44.52

APPENDIX A-8

NORTH OF MARLIN SEDIMENT

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Result or 1/2 SDL (1,2-dichloroethane)

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		40
Raw Statistics			Log-transformed Statistics		
Minimum		6.1500E-5	Minimum of Log Data		-9.696
Maximum		0.0024	Maximum of Log Data		-6.032
Mean		2.4915E-4	Mean of log Data		-9.1
Median		7.6250E-5	SD of log Data		0.927
SD		5.4106E-4			
Coefficient of Variation		2.172			
Skewness		3.34			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.373	Shapiro Wilk Test Statistic		0.564
Shapiro Wilk Critical Value		0.947	Shapiro Wilk Critical Value		0.947
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		3.8018E-4	95% H-UCL		2.3239E-4
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		2.8326E-4
95% Adjusted-CLT UCL		4.1783E-4	97.5% Chebyshev (MVUE) UCL		3.3255E-4
95% Modified-t UCL		3.8646E-4	99% Chebyshev (MVUE) UCL		4.2936E-4
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.713	Data do not follow a Discernable Distribution (0.05)		
Theta Star		3.4927E-4			
nu star		68.48			
Approximate Chi Square Value (.05)		50.43	Nonparametric Statistics		
Adjusted Level of Significance		0.045	95% CLT UCL		3.7760E-4
Adjusted Chi Square Value		49.95	95% Jackknife UCL		3.8018E-4
			95% Standard Bootstrap UCL		3.7454E-4
Anderson-Darling Test Statistic		11.29	95% Bootstrap-t UCL		4.7307E-4
Anderson-Darling 5% Critical Value		0.792	95% Hall's Bootstrap UCL		3.6616E-4
Kolmogorov-Smirnov Test Statistic		0.392	95% Percentile Bootstrap UCL		3.8040E-4
Kolmogorov-Smirnov 5% Critical Value		0.133	95% BCA Bootstrap UCL		4.2357E-4
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		5.8956E-4
			97.5% Chebyshev(Mean, Sd) UCL		7.3685E-4
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0010
95% Approximate Gamma UCL		3.3830E-4			
95% Adjusted Gamma UCL		3.4156E-4			

General Statistics					
Number of Valid Samples		56	Number of Unique Samples		52
Raw Statistics			Log-transformed Statistics		
Minimum		7.7000E-5	Minimum of Log Data		-9.472
Maximum		0.0092	Maximum of Log Data		-4.686
Mean		9.5155E-4	Mean of log Data		-7.784
Median		3.5500E-4	SD of log Data		1.284
SD		0.0015			
Coefficient of Variation		1.597			
Skewness		3.563			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Lilliefors Test Statistic		0.287	Lilliefors Test Statistic		0.142
Lilliefors Critical Value		0.118	Lilliefors Critical Value		0.118
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0012	95% H-UCL		0.0014
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0018
95% Adjusted-CLT UCL		0.0013	97.5% Chebyshev (MVUE) UCL		0.0021
95% Modified-t UCL		0.0013	99% Chebyshev (MVUE) UCL		0.0029
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.7	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.0013			
nu star		78.45			
Approximate Chi Square Value (.05)		59.05	Nonparametric Statistics		
Adjusted Level of Significance		0.0457	95% CLT UCL		0.0012
Adjusted Chi Square Value		58.6	95% Jackknife UCL		0.0012
			95% Standard Bootstrap UCL		0.0012
Anderson-Darling Test Statistic		2.244	95% Bootstrap-t UCL		0.0015
Anderson-Darling 5% Critical Value		0.795	95% Hall's Bootstrap UCL		0.0018
Kolmogorov-Smirnov Test Statistic		0.194	95% Percentile Bootstrap UCL		0.0013
Kolmogorov-Smirnov 5% Critical Value		0.124	95% BCA Bootstrap UCL		0.0014
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.0018
			97.5% Chebyshev(Mean, Sd) UCL		0.0022
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0029
95% Approximate Gamma UCL		0.0012			
95% Adjusted Gamma UCL		0.0012			
Potential UCL to Use			Use 97.5% Chebyshev (Mean, Sd) UCL		0.0022

Result or 1/2 SDL (acenaphthene)

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		34
Raw Statistics			Log-transformed Statistics		
Minimum		0.0042	Minimum of Log Data		-5.46

Maximum	0.133	Maximum of Log Data	-2.017
Mean	0.0195	Mean of log Data	-4.671
Median	0.0055	SD of log Data	1.034
SD	0.031		
Coefficient of Variation	1.59		
Skewness	2.314		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.546	Shapiro Wilk Test Statistic	0.667
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.027	95% H-UCL	0.0228
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0278
95% Adjusted-CLT UCL	0.0285	97.5% Chebyshev (MVUE) UCL	0.0331
95% Modified-t UCL	0.0273	99% Chebyshev (MVUE) UCL	0.0434
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.771	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0253		
nu star	74.06		
Approximate Chi Square Value (.05)	55.24	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0269
Adjusted Chi Square Value	54.74	95% Jackknife UCL	0.027
		95% Standard Bootstrap UCL	0.0267
Anderson-Darling Test Statistic	8.594	95% Bootstrap-t UCL	0.0293
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	0.0276
Kolmogorov-Smirnov Test Statistic	0.357	95% Percentile Bootstrap UCL	0.0272
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0296
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.039
		97.5% Chebyshev(Mean, Sd) UCL	0.0475
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.064
95% Approximate Gamma UCL	0.0261		
95% Adjusted Gamma UCL	0.0264		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.064

Result or 1/2 SDL (acenaphthylene)

General Statistics

Number of Valid Samples		48	Number of Unique Samples		36
Raw Statistics			Log-transformed Statistics		
Minimum	0.0037		Minimum of Log Data	-5.591	
Maximum	0.545		Maximum of Log Data	-0.607	
Mean	0.0314		Mean of log Data	-4.703	
Median	0.0063		SD of log Data	1.137	
SD	0.0928				
Coefficient of Variation	2.957				

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Result or 1/2 SDL (aluminum)

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		38
Raw Statistics			Log-transformed Statistics		
Minimum	3400		Minimum of Log Data	8.132	
Maximum	19200		Maximum of Log Data	9.863	
Mean	13229		Mean of log Data	9.454	
Median	13650		SD of log Data	0.296	
SD	3162				
Coefficient of Variation	0.239				
Skewness	-0.611				

Relevant UCL Statistics								
Normal Distribution Test					Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.972			Shapiro Wilk Test Statistic		0.854	

Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13995	95% H-UCL	14384
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15840
95% Adjusted-CLT UCL	13936	97.5% Chebyshev (MVUE) UCL	16931
95% Modified-t UCL	13988	99% Chebyshev (MVUE) UCL	19075
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.16	Data appear Normal at 5% Significance Level	
Theta Star	1005		
nu star	1264		
Approximate Chi Square Value (.05)	1182	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	13980
Adjusted Chi Square Value	1180	95% Jackknife UCL	13995
		95% Standard Bootstrap UCL	13978
Anderson-Darling Test Statistic	0.922	95% Bootstrap-t UCL	13984
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	13975
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	13979
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	13943
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15218
		97.5% Chebyshev(Mean, Sd) UCL	16079
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17770
95% Approximate Gamma UCL	14141		
95% Adjusted Gamma UCL	14170		
Potential UCL to Use		Use 95% Student's-t UCL	13995

Result or 1/2 SDL (anthracene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	0.0029	Minimum of Log Data	-5.821
Maximum	0.334	Maximum of Log Data	-1.097
Mean	0.0288	Mean of log Data	-4.661
Median	0.0060	SD of log Data	1.197
SD	0.0678		
Coefficient of Variation	2.358		
Skewness	3.546		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.418	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0452	95% H-UCL	0.0302

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0364
95% Adjusted-CLT UCL	0.0502	97.5% Chebyshev (MVUE) UCL		0.044
95% Modified-t UCL	0.046	99% Chebyshev (MVUE) UCL		0.0589
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.54	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0533			
nu star	51.83			
Approximate Chi Square Value (.05)	36.3	Nonparametric Statistics		
Adjusted Level of Significance	0.045	95% CLT UCL		0.0448
Adjusted Chi Square Value	35.89	95% Jackknife UCL		0.0452
		95% Standard Bootstrap UCL		0.0446
Anderson-Darling Test Statistic	7.224	95% Bootstrap-t UCL		0.0585
Anderson-Darling 5% Critical Value	0.809	95% Hall's Bootstrap UCL		0.0447
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL		0.0466
Kolmogorov-Smirnov 5% Critical Value	0.135	95% BCA Bootstrap UCL		0.0521
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0714
		97.5% Chebyshev(Mean, Sd) UCL		0.0899
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.126
95% Approximate Gamma UCL	0.0411			
95% Adjusted Gamma UCL	0.0415			
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL		0.126

Result or 1/2 SDL (antimony)

General Statistics					
Number of Valid Samples		47	Number of Unique Samples		35
Raw Statistics			Log-transformed Statistics		
Minimum		0.12	Minimum of Log Data		-2.12
Maximum		4.24	Maximum of Log Data		1.445
Mean		1.154	Mean of log Data		-0.151
Median		1.14	SD of log Data		0.938
SD		0.724			
Coefficient of Variation		0.627			
Skewness		1.485			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.863	Shapiro Wilk Test Statistic		0.756
Shapiro Wilk Critical Value		0.946	Shapiro Wilk Critical Value		0.946
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		1.331	95% H-UCL		1.826
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		2.226
95% Adjusted-CLT UCL		1.352	97.5% Chebyshev (MVUE) UCL		2.619
95% Modified-t UCL		1.335	99% Chebyshev (MVUE) UCL		3.39
Gamma Distribution Test			Data Distribution		

k star (bias corrected)	1.745	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.661		
nu star	164.1		
Approximate Chi Square Value (.05)	135.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0449	95% CLT UCL	1.328
Adjusted Chi Square Value	134.6	95% Jackknife UCL	1.331
		95% Standard Bootstrap UCL	1.329
Anderson-Darling Test Statistic	3.362	95% Bootstrap-t UCL	1.348
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	1.387
Kolmogorov-Smirnov Test Statistic	0.237	95% Percentile Bootstrap UCL	1.331
Kolmogorov-Smirnov 5% Critical Value	0.131	95% BCA Bootstrap UCL	1.357
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.614
		97.5% Chebyshev(Mean, Sd) UCL	1.814
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.205
95% Approximate Gamma UCL	1.398		
95% Adjusted Gamma UCL	1.406		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.614

Result or 1/2 SDL (arsenic)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	47
Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	12.8	Maximum of Log Data	2.549
Mean	2.534	Mean of log Data	0.199
Median	2.19	SD of log Data	1.521
SD	2.465		
Coefficient of Variation	0.973		
Skewness	1.753		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.131	95% H-UCL	7.442
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.391
95% Adjusted-CLT UCL	3.215	97.5% Chebyshev (MVUE) UCL	10.42
95% Modified-t UCL	3.146	99% Chebyshev (MVUE) UCL	14.42
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.774	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	3.273		
nu star	74.32		
Approximate Chi Square Value (.05)	55.47	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	3.119

Adjusted Chi Square Value	54.96	95% Jackknife UCL	3.131
		95% Standard Bootstrap UCL	3.105
Anderson-Darling Test Statistic	1.067	95% Bootstrap-t UCL	3.239
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	3.333
Kolmogorov-Smirnov Test Statistic	0.13	95% Percentile Bootstrap UCL	3.167
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	3.266
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.085
		97.5% Chebyshev(Mean, Sd) UCL	4.756
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.074
95% Approximate Gamma UCL	3.395		
95% Adjusted Gamma UCL	3.427		
Potential UCL to Use		Use 95% Approximate Gamma UCL	3.395

Result or 1/2 SDL (barium)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	46
Raw Statistics		Log-transformed Statistics	
Minimum	36	Minimum of Log Data	3.584
Maximum	820	Maximum of Log Data	6.709
Mean	151.7	Mean of log Data	4.792
Median	102.5	SD of log Data	0.623
SD	136.5		
Coefficient of Variation	0.899		
Skewness	3.09		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.653	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	184.8	95% H-UCL	175.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	207
95% Adjusted-CLT UCL	193.5	97.5% Chebyshev (MVUE) UCL	233.6
95% Modified-t UCL	186.2	99% Chebyshev (MVUE) UCL	285.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.194	Data do not follow a Discernable Distribution (0.05)	
Theta Star	69.14		
nu star	210.7		
Approximate Chi Square Value (.05)	178.1	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	184.1
Adjusted Chi Square Value	177.1	95% Jackknife UCL	184.8
		95% Standard Bootstrap UCL	184
Anderson-Darling Test Statistic	2.597	95% Bootstrap-t UCL	203.2
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	214
Kolmogorov-Smirnov Test Statistic	0.219	95% Percentile Bootstrap UCL	186.1

Kolmogorov-Smirnov 5% Critical Value		0.129	95% BCA Bootstrap UCL		192.9
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		237.6
			97.5% Chebyshev(Mean, Sd) UCL		274.7
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		347.7
95% Approximate Gamma UCL		179.5			
95% Adjusted Gamma UCL		180.4			
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		237.6
Result or 1/2 SDL (benzo(a)anthracene)					
General Statistics					
Number of Valid Samples		48	Number of Unique Samples		36
Raw Statistics			Log-transformed Statistics		
Minimum		0.0025	Minimum of Log Data		-5.98
Maximum		0.993	Maximum of Log Data		-0.00702
Mean		0.0543	Mean of log Data		-4.585
Median		0.0056	SD of log Data		1.428
SD		0.175			
Coefficient of Variation		3.226			
Skewness		4.654			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.325	Shapiro Wilk Test Statistic		0.751
Shapiro Wilk Critical Value		0.947	Shapiro Wilk Critical Value		0.947
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.0967	95% H-UCL		0.0509
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.0589
95% Adjusted-CLT UCL		0.114	97.5% Chebyshev (MVUE) UCL		0.0726
95% Modified-t UCL		0.0995	99% Chebyshev (MVUE) UCL		0.0996
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.384	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.141			
nu star		36.84			
Approximate Chi Square Value (.05)		23.95	Nonparametric Statistics		
Adjusted Level of Significance		0.045	95% CLT UCL		0.0959
Adjusted Chi Square Value		23.62	95% Jackknife UCL		0.0967
			95% Standard Bootstrap UCL		0.095
Anderson-Darling Test Statistic		8.124	95% Bootstrap-t UCL		0.27
Anderson-Darling 5% Critical Value		0.839	95% Hall's Bootstrap UCL		0.288
Kolmogorov-Smirnov Test Statistic		0.375	95% Percentile Bootstrap UCL		0.1
Kolmogorov-Smirnov 5% Critical Value		0.137	95% BCA Bootstrap UCL		0.116
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.164
			97.5% Chebyshev(Mean, Sd) UCL		0.212
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.306
95% Approximate Gamma UCL		0.0835			

95% Adjusted Gamma UCL		0.0847			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.306
Result or 1/2 SDL (benzo(a)pyrene)					
General Statistics					
Number of Valid Samples		48	Number of Unique Samples		32
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0043		Minimum of Log Data	-5.447
	Maximum	1.3		Maximum of Log Data	0.262
	Mean	0.104		Mean of log Data	-4.13
	Median	0.0058		SD of log Data	1.695
	SD	0.259			
	Coefficient of Variation	2.493			
	Skewness	3.36			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.455		Shapiro Wilk Test Statistic	0.725
	Shapiro Wilk Critical Value	0.947		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.167		95% H-UCL	0.148
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.156
	95% Adjusted-CLT UCL	0.185		97.5% Chebyshev (MVUE) UCL	0.196
	95% Modified-t UCL	0.17		99% Chebyshev (MVUE) UCL	0.275
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.35	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.297			
	nu star	33.64			
Approximate Chi Square Value (.05)			Nonparametric Statistics		
	Adjusted Level of Significance	0.045		95% CLT UCL	0.165
	Adjusted Chi Square Value	21.07		95% Jackknife UCL	0.167
				95% Standard Bootstrap UCL	0.165
	Anderson-Darling Test Statistic	7.481		95% Bootstrap-t UCL	0.225
	Anderson-Darling 5% Critical Value	0.848		95% Hall's Bootstrap UCL	0.193
	Kolmogorov-Smirnov Test Statistic	0.326		95% Percentile Bootstrap UCL	0.168
	Kolmogorov-Smirnov 5% Critical Value	0.138		95% BCA Bootstrap UCL	0.197
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.267
				97.5% Chebyshev(Mean, Sd) UCL	0.338
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.476
	95% Approximate Gamma UCL	0.164			
	95% Adjusted Gamma UCL	0.166			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		
			0.476		

Result or 1/2 SDL (benzo(b)fluoranthene)									
General Statistics									
Number of Valid Samples			48	Number of Unique Samples			43		
Raw Statistics				Log-transformed Statistics					
Minimum			0.0037	Minimum of Log Data			-5.581		
Maximum			1.36	Maximum of Log Data			0.307		
Mean			0.0902	Mean of log Data			-4.019		
Median			0.0119	SD of log Data			1.65		
SD			0.237						
Coefficient of Variation			2.63						
Skewness			4.175						
Relevant UCL Statistics									
Normal Distribution Test				Lognormal Distribution Test					
Shapiro Wilk Test Statistic			0.413	Shapiro Wilk Test Statistic			0.842		
Shapiro Wilk Critical Value			0.947	Shapiro Wilk Critical Value			0.947		
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level					
Assuming Normal Distribution				Assuming Lognormal Distribution					
95% Student's-t UCL			0.148	95% H-UCL			0.148		
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			0.159		
95% Adjusted-CLT UCL			0.169	97.5% Chebyshev (MVUE) UCL			0.2		
95% Modified-t UCL			0.151	99% Chebyshev (MVUE) UCL			0.279		
Gamma Distribution Test				Data Distribution					
k star (bias corrected)			0.395	Data do not follow a Discernable Distribution (0.05)					
Theta Star			0.228						
nu star			37.94						
Approximate Chi Square Value (.05)			24.84	Nonparametric Statistics					
Adjusted Level of Significance			0.045	95% CLT UCL			0.146		
Adjusted Chi Square Value			24.51	95% Jackknife UCL			0.148		
				95% Standard Bootstrap UCL			0.146		
Anderson-Darling Test Statistic			4.515	95% Bootstrap-t UCL			0.261		
Anderson-Darling 5% Critical Value			0.836	95% Hall's Bootstrap UCL			0.168		
Kolmogorov-Smirnov Test Statistic			0.218	95% Percentile Bootstrap UCL			0.151		
Kolmogorov-Smirnov 5% Critical Value			0.137	95% BCA Bootstrap UCL			0.175		
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL			0.239		
				97.5% Chebyshev(Mean, Sd) UCL			0.304		
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL			0.431		
95% Approximate Gamma UCL			0.138						
95% Adjusted Gamma UCL			0.14						
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL			0.431		
Result or 1/2 SDL (benzo(g,h,i)perylene)									
General Statistics									
Number of Valid Samples			48	Number of Unique Samples			38		

Raw Statistics			Log-transformed Statistics		
	Minimum	0.0043		Minimum of Log Data	-5.446
	Maximum	1.94		Maximum of Log Data	0.663
	Mean	0.198		Mean of log Data	-3.047
	Median	0.0648		SD of log Data	1.783
	SD	0.388			
	Coefficient of Variation	1.959			
	Skewness	3.146			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.548		Shapiro Wilk Test Statistic	0.917
	Shapiro Wilk Critical Value	0.947		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.292		95% H-UCL	0.546
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.553
	95% Adjusted-CLT UCL	0.317		97.5% Chebyshev (MVUE) UCL	0.699
	95% Modified-t UCL	0.296		99% Chebyshev (MVUE) UCL	0.986
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.438	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.453			
	nu star	42.01			
	Approximate Chi Square Value (.05)	28.16	Nonparametric Statistics		
	Adjusted Level of Significance	0.045		95% CLT UCL	0.29
	Adjusted Chi Square Value	27.8		95% Jackknife UCL	0.292
				95% Standard Bootstrap UCL	0.29
	Anderson-Darling Test Statistic	1.962		95% Bootstrap-t UCL	0.352
	Anderson-Darling 5% Critical Value	0.826		95% Hall's Bootstrap UCL	0.364
	Kolmogorov-Smirnov Test Statistic	0.159		95% Percentile Bootstrap UCL	0.296
	Kolmogorov-Smirnov 5% Critical Value	0.136		95% BCA Bootstrap UCL	0.325
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.442
				97.5% Chebyshev(Mean, Sd) UCL	0.548
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	0.755
	95% Approximate Gamma UCL	0.296			
	95% Adjusted Gamma UCL	0.299			
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL	0.755

Result or 1/2 SDL (benzo(k)fluoranthene)

General Statistics					
	Number of Valid Samples	48		Number of Unique Samples	30
Raw Statistics			Log-transformed Statistics		
	Minimum	0.005		Minimum of Log Data	-5.298
	Maximum	0.73		Maximum of Log Data	-0.315
	Mean	0.0659		Mean of log Data	-3.783
	Median	0.009		SD of log Data	1.455

SD	0.119		
Coefficient of Variation	1.813		
Skewness	4.12		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.538	Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0948	95% H-UCL	0.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.138
95% Adjusted-CLT UCL	0.105	97.5% Chebyshev (MVUE) UCL	0.171
95% Modified-t UCL	0.0965	99% Chebyshev (MVUE) UCL	0.235
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.561	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.117		
nu star	53.85		
Approximate Chi Square Value (.05)	37.99	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0942
Adjusted Chi Square Value	37.57	95% Jackknife UCL	0.0948
		95% Standard Bootstrap UCL	0.0947
Anderson-Darling Test Statistic	4.058	95% Bootstrap-t UCL	0.121
Anderson-Darling 5% Critical Value	0.807	95% Hall's Bootstrap UCL	0.229
Kolmogorov-Smirnov Test Statistic	0.333	95% Percentile Bootstrap UCL	0.0971
Kolmogorov-Smirnov 5% Critical Value	0.134	95% BCA Bootstrap UCL	0.112
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.141
		97.5% Chebyshev(Mean, Sd) UCL	0.174
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.237
95% Approximate Gamma UCL	0.0934		
95% Adjusted Gamma UCL	0.0944		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.237

Result or 1/2 SDL (beryllium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	36
Raw Statistics		Log-transformed Statistics	
Minimum	0.28	Minimum of Log Data	-1.273
Maximum	1.37	Maximum of Log Data	0.315
Mean	0.894	Mean of log Data	-0.144
Median	0.93	SD of log Data	0.269
SD	0.206		
Coefficient of Variation	0.23		
Skewness	-0.364		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.983		Shapiro Wilk Test Statistic		0.896	
Shapiro Wilk Critical Value		0.947		Shapiro Wilk Critical Value		0.947	
Data appear Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.943		95% H-UCL		0.962	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		1.051	
95% Adjusted-CLT UCL		0.941		97.5% Chebyshev (MVUE) UCL		1.118	
95% Modified-t UCL		0.943		99% Chebyshev (MVUE) UCL		1.249	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		15.18		Data appear Normal at 5% Significance Level			
Theta Star		0.0589					
nu star		1457					
Approximate Chi Square Value (.05)		1369		Nonparametric Statistics			
Adjusted Level of Significance		0.045		95% CLT UCL		0.942	
Adjusted Chi Square Value		1367		95% Jackknife UCL		0.943	
				95% Standard Bootstrap UCL		0.942	
Anderson-Darling Test Statistic		0.763		95% Bootstrap-t UCL		0.939	
Anderson-Darling 5% Critical Value		0.749		95% Hall's Bootstrap UCL		0.939	
Kolmogorov-Smirnov Test Statistic		0.149		95% Percentile Bootstrap UCL		0.942	
Kolmogorov-Smirnov 5% Critical Value		0.128		95% BCA Bootstrap UCL		0.938	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		1.023	
				97.5% Chebyshev(Mean, Sd) UCL		1.079	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		1.189	
95% Approximate Gamma UCL		0.951					
95% Adjusted Gamma UCL		0.953					
Potential UCL to Use				Use 95% Student's-t UCL		0.943	

Result or 1/2 SDL (boron)

General Statistics			
Number of Valid Samples		48	
Number of Unique Samples			46
Raw Statistics		Log-transformed Statistics	
Minimum	0.58	Minimum of Log Data	-0.545
Maximum	46.2	Maximum of Log Data	3.833
Mean	14.49	Mean of log Data	2.02
Median	11.4	SD of log Data	1.466
SD	12.22		
Coefficient of Variation	0.844		
Skewness	0.839		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic		0.901	
Shapiro Wilk Critical Value		0.947	
Data not Normal at 5% Significance Level			
Data not Lognormal at 5% Significance Level			

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		17.45		95% H-UCL		40.7	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		46.66	
95% Adjusted-CLT UCL		17.62		97.5% Chebyshev (MVUE) UCL		57.72	
95% Modified-t UCL		17.48		99% Chebyshev (MVUE) UCL		79.44	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.853		Data do not follow a Discernable Distribution (0.05)			
Theta Star		16.98					
nu star		81.9					
Approximate Chi Square Value (.05)		62.05		Nonparametric Statistics			
Adjusted Level of Significance		0.045		95% CLT UCL		17.39	
Adjusted Chi Square Value		61.51		95% Jackknife UCL		17.45	
				95% Standard Bootstrap UCL		17.3	
Anderson-Darling Test Statistic		1.863		95% Bootstrap-t UCL		17.73	
Anderson-Darling 5% Critical Value		0.784		95% Hall's Bootstrap UCL		17.66	
Kolmogorov-Smirnov Test Statistic		0.164		95% Percentile Bootstrap UCL		17.35	
Kolmogorov-Smirnov 5% Critical Value		0.132		95% BCA Bootstrap UCL		17.58	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		22.18	
				97.5% Chebyshev(Mean, Sd) UCL		25.5	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		32.04	
95% Approximate Gamma UCL		19.12					
95% Adjusted Gamma UCL		19.29					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		32.04	

Result or 1/2 SDL (cadmium)

General Statistics			
Number of Valid Samples		48	Number of Unique Samples 35
Raw Statistics		Log-transformed Statistics	
Minimum	0.0029	Minimum of Log Data	-5.843
Maximum	0.48	Maximum of Log Data	-0.734
Mean	0.103	Mean of log Data	-3.439
Median	0.0158	SD of log Data	1.593
SD	0.146		
Coefficient of Variation	1.423		
Skewness	1.467		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.869
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		95% H-UCL	0.231
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.254
95% Adjusted-CLT UCL		97.5% Chebyshev (MVUE) UCL	0.317
95% Modified-t UCL		99% Chebyshev (MVUE) UCL	0.442

Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.52		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.198					
nu star		49.9					
Approximate Chi Square Value (.05)		34.68		Nonparametric Statistics			
Adjusted Level of Significance		0.045		95% CLT UCL		0.137	
Adjusted Chi Square Value		34.29		95% Jackknife UCL		0.138	
				95% Standard Bootstrap UCL		0.139	
Anderson-Darling Test Statistic		3.459		95% Bootstrap-t UCL		0.148	
Anderson-Darling 5% Critical Value		0.81		95% Hall's Bootstrap UCL		0.144	
Kolmogorov-Smirnov Test Statistic		0.286		95% Percentile Bootstrap UCL		0.137	
Kolmogorov-Smirnov 5% Critical Value		0.135		95% BCA Bootstrap UCL		0.142	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.195	
				97.5% Chebyshev(Mean, Sd) UCL		0.235	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.313	
95% Approximate Gamma UCL		0.148					
95% Adjusted Gamma UCL		0.15					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.313	
Result or 1/2 SDL (carbazole)							
General Statistics							
Number of Valid Samples		48		Number of Unique Samples		35	
Raw Statistics				Log-transformed Statistics			
Minimum		0.0040		Minimum of Log Data		-5.507	
Maximum		0.141		Maximum of Log Data		-1.959	
Mean		0.0192		Mean of log Data		-4.698	
Median		0.0055		SD of log Data		1.042	
SD		0.0315					
Coefficient of Variation		1.637					
Skewness		2.515					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.54		Shapiro Wilk Test Statistic		0.683	
Shapiro Wilk Critical Value		0.947		Shapiro Wilk Critical Value		0.947	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0269		95% H-UCL		0.0225	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0274	
95% Adjusted-CLT UCL		0.0285		97.5% Chebyshev (MVUE) UCL		0.0326	
95% Modified-t UCL		0.0271		99% Chebyshev (MVUE) UCL		0.0428	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.759		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0253					
nu star		72.88					

Approximate Chi Square Value (.05)	54.22	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0267
Adjusted Chi Square Value	53.72	95% Jackknife UCL	0.0269
		95% Standard Bootstrap UCL	0.0266
Anderson-Darling Test Statistic	8.173	95% Bootstrap-t UCL	0.0305
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	0.0283
Kolmogorov-Smirnov Test Statistic	0.369	95% Percentile Bootstrap UCL	0.0274
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0287
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0391
		97.5% Chebyshev(Mean, Sd) UCL	0.0476
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0645
95% Approximate Gamma UCL	0.0259		
95% Adjusted Gamma UCL	0.0261		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0645

Result or 1/2 SDL (carbon disulfide)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	38
Raw Statistics		Log-transformed Statistics	
Minimum	5.9000E-5	Minimum of Log Data	-9.738
Maximum	0.0069	Maximum of Log Data	-4.963
Mean	5.2498E-4	Mean of log Data	-9.042
Median	7.1500E-5	SD of log Data	1.244
SD	0.0014		
Coefficient of Variation	2.753		
Skewness	3.417		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.369	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.7506E-4	95% H-UCL	4.1104E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.9331E-4
95% Adjusted-CLT UCL	9.7810E-4	97.5% Chebyshev (MVUE) UCL	5.9875E-4
95% Modified-t UCL	8.9220E-4	99% Chebyshev (MVUE) UCL	8.0588E-4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.422	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0012		
nu star	40.53		
Approximate Chi Square Value (.05)	26.94	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	8.6816E-4
Adjusted Chi Square Value	26.6	95% Jackknife UCL	8.7506E-4
		95% Standard Bootstrap UCL	8.6161E-4
Anderson-Darling Test Statistic	12.67	95% Bootstrap-t UCL	0.0011

Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	8.5064E-4
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	9.0636E-4
Kolmogorov-Smirnov 5% Critical Value	0.136	95% BCA Bootstrap UCL	9.8527E-4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0014
		97.5% Chebyshev(Mean, Sd) UCL	0.0018
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0026
95% Approximate Gamma UCL	7.8974E-4		
95% Adjusted Gamma UCL	7.9995E-4		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0026

Result or 1/2 SDL (chromium)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	42
Raw Statistics		Log-transformed Statistics	
Minimum	8.96	Minimum of Log Data	2.193
Maximum	44.6	Maximum of Log Data	3.798
Mean	15.07	Mean of log Data	2.667
Median	14.1	SD of log Data	0.286
SD	5.536		
Coefficient of Variation	0.367		
Skewness	3.399		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.716	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.41	95% H-UCL	16.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.73
95% Adjusted-CLT UCL	16.81	97.5% Chebyshev (MVUE) UCL	18.91
95% Modified-t UCL	16.48	99% Chebyshev (MVUE) UCL	21.24
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.44	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.443		
nu star	1003		
Approximate Chi Square Value (.05)	930.2	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	16.39
Adjusted Chi Square Value	928	95% Jackknife UCL	16.41
		95% Standard Bootstrap UCL	16.4
Anderson-Darling Test Statistic	1.41	95% Bootstrap-t UCL	17.14
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	22.68
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	16.47
Kolmogorov-Smirnov 5% Critical Value	0.128	95% BCA Bootstrap UCL	16.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.56
		97.5% Chebyshev(Mean, Sd) UCL	20.06

Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.02
95% Approximate Gamma UCL	16.25		
95% Adjusted Gamma UCL	16.29		
Potential UCL to Use		Use 95% Student's-t UCL	16.41
		or 95% Modified-t UCL	16.48

Result or 1/2 SDL (chromium vi)

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	25
Raw Statistics		Log-transformed Statistics	
Minimum	0.181	Minimum of Log Data	-1.712
Maximum	4.04	Maximum of Log Data	1.396
Mean	0.956	Mean of log Data	-0.684
Median	0.284	SD of log Data	1.105
SD	1.207		
Coefficient of Variation	1.263		
Skewness	1.817		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.672	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.369	95% H-UCL	1.686
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.894
95% Adjusted-CLT UCL	1.447	97.5% Chebyshev (MVUE) UCL	2.326
95% Modified-t UCL	1.383	99% Chebyshev (MVUE) UCL	3.174

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.831	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.15		
nu star	41.53		
Approximate Chi Square Value (.05)	27.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0395	95% CLT UCL	1.353
Adjusted Chi Square Value	26.99	95% Jackknife UCL	1.369
		95% Standard Bootstrap UCL	1.353
Anderson-Darling Test Statistic	2.142	95% Bootstrap-t UCL	1.559
Anderson-Darling 5% Critical Value	0.777	95% Hall's Bootstrap UCL	1.396
Kolmogorov-Smirnov Test Statistic	0.254	95% Percentile Bootstrap UCL	1.33
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	1.459
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.008
		97.5% Chebyshev(Mean, Sd) UCL	2.463
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.358
95% Approximate Gamma UCL	1.43		
95% Adjusted Gamma UCL	1.47		

Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		3.358
Result or 1/2 SDL (chrysene)					
General Statistics					
Number of Valid Samples		48	Number of Unique Samples		39
Raw Statistics			Log-transformed Statistics		
	Minimum	0.0037		Minimum of Log Data	-5.579
	Maximum	4.05		Maximum of Log Data	1.399
	Mean	0.217		Mean of log Data	-3.867
	Median	0.0077		SD of log Data	1.845
	SD	0.715			
	Coefficient of Variation	3.295			
	Skewness	4.448			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.344		Shapiro Wilk Test Statistic	0.809
	Shapiro Wilk Critical Value	0.947		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	0.39		95% H-UCL	0.284
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	0.278
	95% Adjusted-CLT UCL	0.457		97.5% Chebyshev (MVUE) UCL	0.353
	95% Modified-t UCL	0.401		99% Chebyshev (MVUE) UCL	0.499
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	0.291	Data do not follow a Discernable Distribution (0.05)		
	Theta Star	0.746			
	nu star	27.93			
Approximate Chi Square Value (.05)			Nonparametric Statistics		
	Adjusted Level of Significance	0.045		95% CLT UCL	0.387
	Adjusted Chi Square Value	16.61		95% Jackknife UCL	0.39
				95% Standard Bootstrap UCL	0.386
	Anderson-Darling Test Statistic	6.798		95% Bootstrap-t UCL	0.914
	Anderson-Darling 5% Critical Value	0.864		95% Hall's Bootstrap UCL	1.021
	Kolmogorov-Smirnov Test Statistic	0.262		95% Percentile Bootstrap UCL	0.395
	Kolmogorov-Smirnov 5% Critical Value	0.139		95% BCA Bootstrap UCL	0.484
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	0.667
				97.5% Chebyshev(Mean, Sd) UCL	0.861
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	1.244
	95% Approximate Gamma UCL	0.359			
	95% Adjusted Gamma UCL	0.365			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		1.244

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		46
Raw Statistics			Log-transformed Statistics		
Minimum		3	Minimum of Log Data		1.099
Maximum		9.89	Maximum of Log Data		2.292
Mean		6.977	Mean of log Data		1.92
Median		7.29	SD of log Data		0.223
SD		1.408			
Coefficient of Variation		0.202			
Skewness		-0.339			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.973	Shapiro Wilk Test Statistic		0.927
Shapiro Wilk Critical Value		0.947	Shapiro Wilk Critical Value		0.947
Data appear Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		7.318	95% H-UCL		7.397
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		7.977
95% Adjusted-CLT UCL		7.3	97.5% Chebyshev (MVUE) UCL		8.405
95% Modified-t UCL		7.316	99% Chebyshev (MVUE) UCL		9.245
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		21.03	Data appear Normal at 5% Significance Level		
Theta Star		0.332			
nu star		2019			
Approximate Chi Square Value (.05)		1915	Nonparametric Statistics		
Adjusted Level of Significance		0.045	95% CLT UCL		7.311
Adjusted Chi Square Value		1912	95% Jackknife UCL		7.318
			95% Standard Bootstrap UCL		7.303
Anderson-Darling Test Statistic		0.753	95% Bootstrap-t UCL		7.303
Anderson-Darling 5% Critical Value		0.748	95% Hall's Bootstrap UCL		7.301
Kolmogorov-Smirnov Test Statistic		0.15	95% Percentile Bootstrap UCL		7.294
Kolmogorov-Smirnov 5% Critical Value		0.128	95% BCA Bootstrap UCL		7.295
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		7.863
			97.5% Chebyshev(Mean, Sd) UCL		8.246
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		8.999
95% Approximate Gamma UCL		7.353			
95% Adjusted Gamma UCL		7.365			
Potential UCL to Use			Use 95% Student's-t UCL		7.318

Result or 1/2 SDL (copper)

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		44
Raw Statistics			Log-transformed Statistics		
Minimum		5.44	Minimum of Log Data		1.694

	Maximum	49			Maximum of Log Data	3.892					
	Mean	14.49			Mean of log Data	2.553					
	Median	13.15			SD of log Data	0.471					
	SD	8.49									
	Coefficient of Variation	0.586									
	Skewness	2.371									

Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.755		Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.947		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
95% Student's-t UCL	16.55		95% H-UCL	16.31
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	18.75
95% Adjusted-CLT UCL	16.96		97.5% Chebyshev (MVUE) UCL	20.66
95% Modified-t UCL	16.62		99% Chebyshev (MVUE) UCL	24.43
Gamma Distribution Test			Data Distribution	
k star (bias corrected)	4.055		Data appear Lognormal at 5% Significance Level	
Theta Star	3.574			
nu star	389.3			
Approximate Chi Square Value (.05)	344.6		Nonparametric Statistics	
Adjusted Level of Significance	0.045		95% CLT UCL	16.51
Adjusted Chi Square Value	343.3		95% Jackknife UCL	16.55
			95% Standard Bootstrap UCL	16.5
Anderson-Darling Test Statistic	1.342		95% Bootstrap-t UCL	17.15
Anderson-Darling 5% Critical Value	0.753		95% Hall's Bootstrap UCL	17.64
Kolmogorov-Smirnov Test Statistic	0.159		95% Percentile Bootstrap UCL	16.71
Kolmogorov-Smirnov 5% Critical Value	0.128		95% BCA Bootstrap UCL	17.17
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	19.83
			97.5% Chebyshev(Mean, Sd) UCL	22.14
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	26.68
95% Approximate Gamma UCL	16.37			
95% Adjusted Gamma UCL	16.43			
Potential UCL to Use			Use 95% Student's-t UCL	16.55
			or 95% Modified-t UCL	16.62
			or 95% H-UCL	16.31

Result or 1/2 SDL (dibenz(a,h)anthracene)

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		39
Raw Statistics			Log-transformed Statistics		
Minimum		0.0031	Minimum of Log Data		-5.752
Maximum		2.91	Maximum of Log Data		1.068
Mean		0.203	Mean of log Data		-3.828
Median		0.0188	SD of log Data		1.8

SD	0.625		
Coefficient of Variation	3.076		
Skewness	3.829		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.355	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.354	95% H-UCL	0.262
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.263
95% Adjusted-CLT UCL	0.405	97.5% Chebyshev (MVUE) UCL	0.333
95% Modified-t UCL	0.363	99% Chebyshev (MVUE) UCL	0.47
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.302	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.672		
nu star	29.01		
Approximate Chi Square Value (.05)	17.72	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.351
Adjusted Chi Square Value	17.44	95% Jackknife UCL	0.354
		95% Standard Bootstrap UCL	0.356
Anderson-Darling Test Statistic	6.795	95% Bootstrap-t UCL	0.558
Anderson-Darling 5% Critical Value	0.86	95% Hall's Bootstrap UCL	0.358
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	0.371
Kolmogorov-Smirnov 5% Critical Value	0.139	95% BCA Bootstrap UCL	0.421
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.596
		97.5% Chebyshev(Mean, Sd) UCL	0.766
		99% Chebyshev(Mean, Sd) UCL	1.1
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.333		
95% Adjusted Gamma UCL	0.338		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.1

Result or 1/2 SDL (dibenzofuran)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	0.0025	Minimum of Log Data	-5.98
Maximum	0.08	Maximum of Log Data	-2.526
Mean	0.0139	Mean of log Data	-4.779
Median	0.0079	SD of log Data	0.932
SD	0.0176		
Coefficient of Variation	1.267		
Skewness	2.343		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.626		Shapiro Wilk Test Statistic		0.877	
Shapiro Wilk Critical Value		0.947		Shapiro Wilk Critical Value		0.947	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.0182		95% H-UCL		0.0176	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.0215	
95% Adjusted-CLT UCL		0.019		97.5% Chebyshev (MVUE) UCL		0.0253	
95% Modified-t UCL		0.0183		99% Chebyshev (MVUE) UCL		0.0326	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		1.075		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0129					
nu star		103.2					
Approximate Chi Square Value (.05)		80.74		Nonparametric Statistics			
Adjusted Level of Significance		0.045		95% CLT UCL		0.0181	
Adjusted Chi Square Value		80.12		95% Jackknife UCL		0.0182	
				95% Standard Bootstrap UCL		0.0179	
Anderson-Darling Test Statistic		3.619		95% Bootstrap-t UCL		0.0192	
Anderson-Darling 5% Critical Value		0.776		95% Hall's Bootstrap UCL		0.0184	
Kolmogorov-Smirnov Test Statistic		0.281		95% Percentile Bootstrap UCL		0.0181	
Kolmogorov-Smirnov 5% Critical Value		0.131		95% BCA Bootstrap UCL		0.0191	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.025	
				97.5% Chebyshev(Mean, Sd) UCL		0.0298	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0392	
95% Approximate Gamma UCL		0.0178					
95% Adjusted Gamma UCL		0.0179					
Potential UCL to Use				Use 95% Chebyshev (Mean, Sd) UCL		0.025	

Result or 1/2 SDL (endosulfan sulfate)

General Statistics			
Number of Valid Samples		48	
Number of Unique Samples			45
Raw Statistics		Log-transformed Statistics	
Minimum	1.4450E-4	Minimum of Log Data	-8.842
Maximum	0.06	Maximum of Log Data	-2.813
Mean	0.0018	Mean of log Data	-8.104
Median	2.1800E-4	SD of log Data	1.163
SD	0.0087		
Coefficient of Variation	4.664		
Skewness	6.541		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic		Shapiro Wilk Test Statistic	0.552
Shapiro Wilk Critical Value		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.626	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0017		
nu star	60.13		
Approximate Chi Square Value (.05)	43.3	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0016
Adjusted Chi Square Value	42.86	95% Jackknife UCL	0.0016
		95% Standard Bootstrap UCL	0.0016
Anderson-Darling Test Statistic	8.68	95% Bootstrap-t UCL	0.0019
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	0.0017
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	0.0016
Kolmogorov-Smirnov 5% Critical Value	0.134	95% BCA Bootstrap UCL	0.0017
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0025
		97.5% Chebyshev(Mean, Sd) UCL	0.0031
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0043
95% Approximate Gamma UCL	0.0015		
95% Adjusted Gamma UCL	0.0015		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0043

Result or 1/2 SDL (endrin ketone)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	47
Raw Statistics		Log-transformed Statistics	
Minimum	1.8950E-4	Minimum of Log Data	-8.571
Maximum	0.013	Maximum of Log Data	-4.343
Mean	7.8543E-4	Mean of log Data	-7.945
Median	2.7550E-4	SD of log Data	0.865
SD	0.0020		
Coefficient of Variation	2.622		
Skewness	5.076		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.31	Shapiro Wilk Test Statistic	0.565
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0012	95% H-UCL	6.7884E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.2500E-4
95% Adjusted-CLT UCL	0.0015	97.5% Chebyshev (MVUE) UCL	9.6143E-4
95% Modified-t UCL	0.0013	99% Chebyshev (MVUE) UCL	0.0012
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.719	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0010		
nu star	68.98		

Approximate Chi Square Value (.05)	50.86	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.0012
Adjusted Chi Square Value	50.38	95% Jackknife UCL	0.0012
		95% Standard Bootstrap UCL	0.0012
Anderson-Darling Test Statistic	11.56	95% Bootstrap-t UCL	0.0024
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	0.0028
Kolmogorov-Smirnov Test Statistic	0.412	95% Percentile Bootstrap UCL	0.0013
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0016
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0020
		97.5% Chebyshev(Mean, Sd) UCL	0.0026
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0037
95% Approximate Gamma UCL	0.0010		
95% Adjusted Gamma UCL	0.0010		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0020

Result or 1/2 SDL (fluoranthene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	34
Raw Statistics		Log-transformed Statistics	
Minimum	0.0032	Minimum of Log Data	-5.734
Maximum	2.17	Maximum of Log Data	0.775
Mean	0.108	Mean of log Data	-4.039
Median	0.0065	SD of log Data	1.566
SD	0.368		
Coefficient of Variation	3.399		
Skewness	4.909		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.309	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.198	95% H-UCL	0.119
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.132
95% Adjusted-CLT UCL	0.236	97.5% Chebyshev (MVUE) UCL	0.165
95% Modified-t UCL	0.204	99% Chebyshev (MVUE) UCL	0.229

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.302		
nu star	34.4		
Approximate Chi Square Value (.05)	21.98	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.196
Adjusted Chi Square Value	21.67	95% Jackknife UCL	0.198
		95% Standard Bootstrap UCL	0.196
Anderson-Darling Test Statistic	6.501	95% Bootstrap-t UCL	0.656

Anderson-Darling 5% Critical Value	0.846	95% Hall's Bootstrap UCL	0.596
Kolmogorov-Smirnov Test Statistic	0.282	95% Percentile Bootstrap UCL	0.206
Kolmogorov-Smirnov 5% Critical Value	0.138	95% BCA Bootstrap UCL	0.264
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.34
		97.5% Chebyshev(Mean, Sd) UCL	0.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.637
95% Approximate Gamma UCL	0.17		
95% Adjusted Gamma UCL	0.172		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.637

Result or 1/2 SDL (fluorene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	38
Raw Statistics		Log-transformed Statistics	
Minimum	0.0033	Minimum of Log Data	-5.715
Maximum	0.139	Maximum of Log Data	-1.973
Mean	0.0186	Mean of log Data	-4.783
Median	0.0055	SD of log Data	1.084
SD	0.0314		
Coefficient of Variation	1.687		
Skewness	2.593		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.73
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0262	95% H-UCL	0.022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0268
95% Adjusted-CLT UCL	0.0279	97.5% Chebyshev (MVUE) UCL	0.0321
95% Modified-t UCL	0.0265	99% Chebyshev (MVUE) UCL	0.0423

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.717	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0259		
nu star	68.81		
Approximate Chi Square Value (.05)	50.71	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.026
Adjusted Chi Square Value	50.23	95% Jackknife UCL	0.0262
		95% Standard Bootstrap UCL	0.0258
Anderson-Darling Test Statistic	7.338	95% Bootstrap-t UCL	0.0295
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	0.0286
Kolmogorov-Smirnov Test Statistic	0.359	95% Percentile Bootstrap UCL	0.0263
Kolmogorov-Smirnov 5% Critical Value	0.133	95% BCA Bootstrap UCL	0.0287
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0383
		97.5% Chebyshev(Mean, Sd) UCL	0.0469

Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.0637
95% Approximate Gamma UCL		0.0252				
95% Adjusted Gamma UCL		0.0255				
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.0637	
Result or 1/2 SDL (gamma-chlordane)						
General Statistics						
Number of Valid Samples		48	Number of Unique Samples		45	
Raw Statistics			Log-transformed Statistics			
Minimum		1.2000E-4	Minimum of Log Data		-9.028	
Maximum		0.0036	Maximum of Log Data		-5.627	
Mean		4.0476E-4	Mean of log Data		-8.298	
Median		2.1800E-4	SD of log Data		0.781	
SD		6.7074E-4				
Coefficient of Variation		1.657				
Skewness		3.738				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.435	Shapiro Wilk Test Statistic		0.75	
Shapiro Wilk Critical Value		0.947	Shapiro Wilk Critical Value		0.947	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		5.6720E-4	95% H-UCL		4.2977E-4	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		5.1879E-4	
95% Adjusted-CLT UCL		6.1982E-4	97.5% Chebyshev (MVUE) UCL		5.9820E-4	
95% Modified-t UCL		5.7591E-4	99% Chebyshev (MVUE) UCL		7.5419E-4	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		1.11	Data do not follow a Discernable Distribution (0.05)			
Theta Star		3.6480E-4				
nu star		106.5				
Approximate Chi Square Value (.05)		83.7	Nonparametric Statistics			
Adjusted Level of Significance		0.045	95% CLT UCL		5.6400E-4	
Adjusted Chi Square Value		83.07	95% Jackknife UCL		5.6720E-4	
			95% Standard Bootstrap UCL		5.6162E-4	
Anderson-Darling Test Statistic		6.585	95% Bootstrap-t UCL		7.3616E-4	
Anderson-Darling 5% Critical Value		0.775	95% Hall's Bootstrap UCL		6.0334E-4	
Kolmogorov-Smirnov Test Statistic		0.299	95% Percentile Bootstrap UCL		5.7445E-4	
Kolmogorov-Smirnov 5% Critical Value		0.131	95% BCA Bootstrap UCL		6.5255E-4	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		8.2676E-4	
			97.5% Chebyshev(Mean, Sd) UCL		0.0010	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.0013	
95% Approximate Gamma UCL		5.1511E-4				
95% Adjusted Gamma UCL		5.1899E-4				
Potential UCL to Use			Use 95% Chebyshev (Mean, Sd) UCL		8.2676E-4	

Result or 1/2 SDL (indeno(1,2,3-cd)pyrene)			
General Statistics			
Number of Valid Samples	48	Number of Unique Samples	40
Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	1.94	Maximum of Log Data	0.663
Mean	0.201	Mean of log Data	-3.037
Median	0.0629	SD of log Data	1.674
SD	0.407		
Coefficient of Variation	2.025		
Skewness	2.987		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.299	95% H-UCL	0.419
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.446
95% Adjusted-CLT UCL	0.324	97.5% Chebyshev (MVUE) UCL	0.56
95% Modified-t UCL	0.304	99% Chebyshev (MVUE) UCL	0.784
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.437	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.46		
nu star	41.91		
Approximate Chi Square Value (.05)	28.07	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.297
Adjusted Chi Square Value	27.72	95% Jackknife UCL	0.299
		95% Standard Bootstrap UCL	0.294
Anderson-Darling Test Statistic	3.169	95% Bootstrap-t UCL	0.344
Anderson-Darling 5% Critical Value	0.826	95% Hall's Bootstrap UCL	0.329
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	0.308
Kolmogorov-Smirnov 5% Critical Value	0.136	95% BCA Bootstrap UCL	0.325
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.457
		97.5% Chebyshev(Mean, Sd) UCL	0.567
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.785
95% Approximate Gamma UCL	0.3		
95% Adjusted Gamma UCL	0.304		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.785

Result or 1/2 SDL (iron)

General Statistics

Number of Valid Samples				48	Number of Unique Samples				37
Raw Statistics					Log-transformed Statistics				
	Minimum	11100				Minimum of Log Data	9.315		
	Maximum	60900				Maximum of Log Data	11.02		
	Mean	17152				Mean of log Data	9.71		
	Median	16650				SD of log Data	0.25		
	SD	6903							
	Coefficient of Variation	0.402							
	Skewness	5.582							
Relevant UCL Statistics									
Normal Distribution Test					Lognormal Distribution Test				
	Shapiro Wilk Test Statistic	0.466				Shapiro Wilk Test Statistic	0.759		
	Shapiro Wilk Critical Value	0.947				Shapiro Wilk Critical Value	0.947		
Data not Normal at 5% Significance Level					Data not Lognormal at 5% Significance Level				
Assuming Normal Distribution					Assuming Lognormal Distribution				
	95% Student's-t UCL	18824				95% H-UCL	18113		
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	19692		
	95% Adjusted-CLT UCL	19649				97.5% Chebyshev (MVUE) UCL	20862		
	95% Modified-t UCL	18958				99% Chebyshev (MVUE) UCL	23161		
Gamma Distribution Test					Data Distribution				
	k star (bias corrected)	11.83			Data do not follow a Discernable Distribution (0.05)				
	Theta Star	1450							
	nu star	1135							
	Approximate Chi Square Value (.05)	1058			Nonparametric Statistics				
	Adjusted Level of Significance	0.045				95% CLT UCL	18791		
	Adjusted Chi Square Value	1056				95% Jackknife UCL	18824		
						95% Standard Bootstrap UCL	18743		
	Anderson-Darling Test Statistic	3.403				95% Bootstrap-t UCL	20880		
	Anderson-Darling 5% Critical Value	0.749				95% Hall's Bootstrap UCL	25732		
	Kolmogorov-Smirnov Test Statistic	0.204				95% Percentile Bootstrap UCL	18919		
	Kolmogorov-Smirnov 5% Critical Value	0.128				95% BCA Bootstrap UCL	20054		
Data not Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	21495		
						97.5% Chebyshev(Mean, Sd) UCL	23374		
Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL	27065		
	95% Approximate Gamma UCL	18404							
	95% Adjusted Gamma UCL	18444							
Potential UCL to Use						Use 95% Student's-t UCL	18824		
						or 95% Modified-t UCL	18958		

Result or 1/2 SDL (lead)

General Statistics									
Number of Valid Samples				48	Number of Unique Samples				45
Raw Statistics					Log-transformed Statistics				
	Minimum	9.4				Minimum of Log Data	2.241		

Maximum	237	Maximum of Log Data	5.468
Mean	25.36	Mean of log Data	2.969
Median	16.7	SD of log Data	0.571
SD	34.13		
Coefficient of Variation	1.346		
Skewness	5.449		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.385	Shapiro Wilk Test Statistic	0.778
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	33.62	95% H-UCL	26.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.57
95% Adjusted-CLT UCL	37.6	97.5% Chebyshev (MVUE) UCL	35.35
95% Modified-t UCL	34.27	99% Chebyshev (MVUE) UCL	42.77
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.932	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.13		
nu star	185.5		
Approximate Chi Square Value (.05)	155	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	33.46
Adjusted Chi Square Value	154.1	95% Jackknife UCL	33.62
		95% Standard Bootstrap UCL	33.36
Anderson-Darling Test Statistic	5.696	95% Bootstrap-t UCL	50.53
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	62.18
Kolmogorov-Smirnov Test Statistic	0.264	95% Percentile Bootstrap UCL	34.16
Kolmogorov-Smirnov 5% Critical Value	0.129	95% BCA Bootstrap UCL	39.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.83
		97.5% Chebyshev(Mean, Sd) UCL	56.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	74.38
95% Approximate Gamma UCL	30.35		
95% Adjusted Gamma UCL	30.52		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	46.83

Result or 1/2 SDL (lithium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	43
Raw Statistics		Log-transformed Statistics	
Minimum	5.43	Minimum of Log Data	1.692
Maximum	27.6	Maximum of Log Data	3.318
Mean	18.65	Mean of log Data	2.9
Median	18.75	SD of log Data	0.25
SD	3.754		
Coefficient of Variation	0.201		

Skewness				-0.745			
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.966		Shapiro Wilk Test Statistic		0.819	
Shapiro Wilk Critical Value		0.947		Shapiro Wilk Critical Value		0.947	
Data appear Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		19.56		95% H-UCL		19.99	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		21.73	
95% Adjusted-CLT UCL		19.48		97.5% Chebyshev (MVUE) UCL		23.03	
95% Modified-t UCL		19.55		99% Chebyshev (MVUE) UCL		25.57	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		18.42		Data appear Normal at 5% Significance Level			
Theta Star		1.013					
nu star		1768					
Approximate Chi Square Value (.05)		1671		Nonparametric Statistics			
Adjusted Level of Significance		0.045		95% CLT UCL		19.55	
Adjusted Chi Square Value		1668		95% Jackknife UCL		19.56	
				95% Standard Bootstrap UCL		19.55	
Anderson-Darling Test Statistic		1.236		95% Bootstrap-t UCL		19.53	
Anderson-Darling 5% Critical Value		0.748		95% Hall's Bootstrap UCL		19.55	
Kolmogorov-Smirnov Test Statistic		0.139		95% Percentile Bootstrap UCL		19.51	
Kolmogorov-Smirnov 5% Critical Value		0.128		95% BCA Bootstrap UCL		19.49	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		21.02	
				97.5% Chebyshev(Mean, Sd) UCL		22.04	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		24.05	
95% Approximate Gamma UCL		19.73					
95% Adjusted Gamma UCL		19.77					
Potential UCL to Use				Use 95% Student's-t UCL		19.56	

Result or 1/2 SDL (manganese)

General Statistics					
Number of Valid Samples		48	Number of Unique Samples		48
Raw Statistics			Log-transformed Statistics		
Minimum		87.6	Minimum of Log Data		4.473
Maximum		1010	Maximum of Log Data		6.918
Mean		331.8	Mean of log Data		5.638
Median		275	SD of log Data		0.583
SD		205.9			
Coefficient of Variation		0.621			
Skewness		1.558			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.856	Shapiro Wilk Test Statistic		0.975

Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	381.7	95% H-UCL	392.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	461.4
95% Adjusted-CLT UCL	387.8	97.5% Chebyshev (MVUE) UCL	517.6
95% Modified-t UCL	382.8	99% Chebyshev (MVUE) UCL	627.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.977	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	111.4		
nu star	285.8		
Approximate Chi Square Value (.05)	247.7	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	380.7
Adjusted Chi Square Value	246.6	95% Jackknife UCL	381.7
		95% Standard Bootstrap UCL	380.3
Anderson-Darling Test Statistic	0.491	95% Bootstrap-t UCL	391.8
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	391.7
Kolmogorov-Smirnov Test Statistic	0.116	95% Percentile Bootstrap UCL	382.9
Kolmogorov-Smirnov 5% Critical Value	0.129	95% BCA Bootstrap UCL	389.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	461.3
		97.5% Chebyshev(Mean, Sd) UCL	517.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	627.5
95% Approximate Gamma UCL	382.9		
95% Adjusted Gamma UCL	384.6		
Potential UCL to Use		Use 95% Approximate Gamma UCL	382.9

Result or 1/2 SDL (mercury)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	36
Raw Statistics		Log-transformed Statistics	
Minimum	0.0012	Minimum of Log Data	-6.685
Maximum	0.081	Maximum of Log Data	-2.513
Mean	0.0199	Mean of log Data	-4.305
Median	0.0113	SD of log Data	0.893
SD	0.0194		
Coefficient of Variation	0.974		
Skewness	1.757		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.756	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0246	95% H-UCL	0.0268

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0327
95% Adjusted-CLT UCL	0.0253	97.5% Chebyshev (MVUE) UCL		0.0382
95% Modified-t UCL	0.0247	99% Chebyshev (MVUE) UCL		0.0491
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.356	Data appear Lognormal at 5% Significance Level		
Theta Star	0.0147			
nu star	130.2			
Approximate Chi Square Value (.05)	104.8	Nonparametric Statistics		
Adjusted Level of Significance	0.045	95% CLT UCL		0.0245
Adjusted Chi Square Value	104.1	95% Jackknife UCL		0.0246
		95% Standard Bootstrap UCL		0.0245
Anderson-Darling Test Statistic	1.641	95% Bootstrap-t UCL		0.0254
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL		0.0252
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL		0.0247
Kolmogorov-Smirnov 5% Critical Value	0.13	95% BCA Bootstrap UCL		0.0254
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0321
		97.5% Chebyshev(Mean, Sd) UCL		0.0374
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.0478
95% Approximate Gamma UCL	0.0247			
95% Adjusted Gamma UCL	0.0249			
Potential UCL to Use		Use 95% H-UCL		0.0268

Result or 1/2 SDL (molybdenum)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	3.24	Maximum of Log Data	1.176
Mean	0.581	Mean of log Data	-1.175
Median	0.38	SD of log Data	1.255
SD	0.677		
Coefficient of Variation	1.166		
Skewness	2.313		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.726	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.745	95% H-UCL	1.094
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.312
95% Adjusted-CLT UCL	0.776	97.5% Chebyshev (MVUE) UCL	1.593
95% Modified-t UCL	0.75	99% Chebyshev (MVUE) UCL	2.147
Gamma Distribution Test		Data Distribution	

k star (bias corrected)	0.88	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.66		
nu star	84.46		
Approximate Chi Square Value (.05)	64.28	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.741
Adjusted Chi Square Value	63.73	95% Jackknife UCL	0.745
		95% Standard Bootstrap UCL	0.738
Anderson-Darling Test Statistic	0.995	95% Bootstrap-t UCL	0.793
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	0.796
Kolmogorov-Smirnov Test Statistic	0.126	95% Percentile Bootstrap UCL	0.746
Kolmogorov-Smirnov 5% Critical Value	0.132	95% BCA Bootstrap UCL	0.777
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.006
		97.5% Chebyshev(Mean, Sd) UCL	1.191
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.553
95% Approximate Gamma UCL	0.763		
95% Adjusted Gamma UCL	0.769		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.763

Result or 1/2 SDL (nickel)

General Statistics			
Number of Valid Samples	50	Number of Unique Samples	43
Raw Statistics		Log-transformed Statistics	
Minimum	10.9	Minimum of Log Data	2.389
Maximum	27.7	Maximum of Log Data	3.321
Mean	17.29	Mean of log Data	2.831
Median	17.3	SD of log Data	0.197
SD	3.391		
Coefficient of Variation	0.196		
Skewness	0.421		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18.09	95% H-UCL	18.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.41
95% Adjusted-CLT UCL	18.11	97.5% Chebyshev (MVUE) UCL	20.33
95% Modified-t UCL	18.09	99% Chebyshev (MVUE) UCL	22.13
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.02	Data appear Normal at 5% Significance Level	
Theta Star	0.691		
nu star	2502		
Approximate Chi Square Value (.05)	2387	Nonparametric Statistics	
Adjusted Level of Significance	0.0452	95% CLT UCL	18.07

Adjusted Chi Square Value	2383	95% Jackknife UCL	18.09
		95% Standard Bootstrap UCL	18.07
Anderson-Darling Test Statistic	0.338	95% Bootstrap-t UCL	18.09
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	18.12
Kolmogorov-Smirnov Test Statistic	0.0827	95% Percentile Bootstrap UCL	18.04
Kolmogorov-Smirnov 5% Critical Value	0.125	95% BCA Bootstrap UCL	18.05
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.38
		97.5% Chebyshev(Mean, Sd) UCL	20.28
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.06
95% Approximate Gamma UCL	18.12		
95% Adjusted Gamma UCL	18.15		
Potential UCL to Use		Use 95% Student's-t UCL	18.09

Result or 1/2 SDL (phenanthrene)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	41
Raw Statistics		Log-transformed Statistics	
Minimum	0.0030	Minimum of Log Data	-5.783
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.0761	Mean of log Data	-4.26
Median	0.0070	SD of log Data	1.508
SD	0.248		
Coefficient of Variation	3.26		
Skewness	4.606		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.309	Shapiro Wilk Test Statistic	0.84
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.136	95% H-UCL	0.0837
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0947
95% Adjusted-CLT UCL	0.16	97.5% Chebyshev (MVUE) UCL	0.118
95% Modified-t UCL	0.14	99% Chebyshev (MVUE) UCL	0.162
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.381	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.2		
nu star	36.62		
Approximate Chi Square Value (.05)	23.77	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.135
Adjusted Chi Square Value	23.45	95% Jackknife UCL	0.136
		95% Standard Bootstrap UCL	0.136
Anderson-Darling Test Statistic	5.99	95% Bootstrap-t UCL	0.472
Anderson-Darling 5% Critical Value	0.84	95% Hall's Bootstrap UCL	0.43
Kolmogorov-Smirnov Test Statistic	0.276	95% Percentile Bootstrap UCL	0.139

Kolmogorov-Smirnov 5% Critical Value		0.137	95% BCA Bootstrap UCL		0.161
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.232
			97.5% Chebyshev(Mean, Sd) UCL		0.3
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.432
95% Approximate Gamma UCL		0.117			
95% Adjusted Gamma UCL		0.119			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.432
Result or 1/2 SDL (pyrene)					
General Statistics					
Number of Valid Samples		48	Number of Unique Samples		38
Raw Statistics			Log-transformed Statistics		
Minimum		0.0040	Minimum of Log Data		-5.502
Maximum		1.64	Maximum of Log Data		0.495
Mean		0.154	Mean of log Data		-3.58
Median		0.0113	SD of log Data		1.729
SD		0.355			
Coefficient of Variation		2.305			
Skewness		3.1			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.48	Shapiro Wilk Test Statistic		0.843
Shapiro Wilk Critical Value		0.947	Shapiro Wilk Critical Value		0.947
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.24	95% H-UCL		0.279
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		0.29
95% Adjusted-CLT UCL		0.263	97.5% Chebyshev (MVUE) UCL		0.366
95% Modified-t UCL		0.244	99% Chebyshev (MVUE) UCL		0.514
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		0.377	Data do not follow a Discernable Distribution (0.05)		
Theta Star		0.408			
nu star		36.18			
Approximate Chi Square Value (.05)		23.41	Nonparametric Statistics		
Adjusted Level of Significance		0.045	95% CLT UCL		0.238
Adjusted Chi Square Value		23.1	95% Jackknife UCL		0.24
			95% Standard Bootstrap UCL		0.236
Anderson-Darling Test Statistic		4.849	95% Bootstrap-t UCL		0.29
Anderson-Darling 5% Critical Value		0.841	95% Hall's Bootstrap UCL		0.247
Kolmogorov-Smirnov Test Statistic		0.256	95% Percentile Bootstrap UCL		0.242
Kolmogorov-Smirnov 5% Critical Value		0.137	95% BCA Bootstrap UCL		0.272
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.377
			97.5% Chebyshev(Mean, Sd) UCL		0.474
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.663
95% Approximate Gamma UCL		0.238			

95% Adjusted Gamma UCL		0.241			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.663
Result or 1/2 SDL (strontium)					
General Statistics					
Number of Valid Samples		48	Number of Unique Samples		47
Raw Statistics			Log-transformed Statistics		
	Minimum	18.8		Minimum of Log Data	2.934
	Maximum	330		Maximum of Log Data	5.799
	Mean	67		Mean of log Data	4.025
	Median	54		SD of log Data	0.557
	SD	52.81			
	Coefficient of Variation	0.788			
	Skewness	3.229			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.671		Shapiro Wilk Test Statistic	0.953
	Shapiro Wilk Critical Value	0.947		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	79.79		95% H-UCL	76.38
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	89.28
	95% Adjusted-CLT UCL	83.33		97.5% Chebyshev (MVUE) UCL	99.75
	95% Modified-t UCL	80.38		99% Chebyshev (MVUE) UCL	120.3
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	2.764	Data appear Lognormal at 5% Significance Level		
	Theta Star	24.24			
	nu star	265.3			
	Approximate Chi Square Value (.05)	228.6	Nonparametric Statistics		
	Adjusted Level of Significance	0.045		95% CLT UCL	79.53
	Adjusted Chi Square Value	227.6		95% Jackknife UCL	79.79
				95% Standard Bootstrap UCL	79.52
	Anderson-Darling Test Statistic	1.725		95% Bootstrap-t UCL	87.35
	Anderson-Darling 5% Critical Value	0.757		95% Hall's Bootstrap UCL	98.08
	Kolmogorov-Smirnov Test Statistic	0.177		95% Percentile Bootstrap UCL	80.25
	Kolmogorov-Smirnov 5% Critical Value	0.129		95% BCA Bootstrap UCL	84.92
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	100.2
				97.5% Chebyshev(Mean, Sd) UCL	114.6
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	142.8
	95% Approximate Gamma UCL	77.76			
	95% Adjusted Gamma UCL	78.12			
Potential UCL to Use			Use 95% H-UCL 76.38		

Result or 1/2 SDL (tin)			
General Statistics			
Number of Valid Samples	48	Number of Unique Samples	31
Raw Statistics		Log-transformed Statistics	
Minimum	0.2	Minimum of Log Data	-1.609
Maximum	4.61	Maximum of Log Data	1.528
Mean	0.638	Mean of log Data	-0.895
Median	0.3	SD of log Data	0.728
SD	0.991		
Coefficient of Variation	1.554		
Skewness	3.165		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.408	Shapiro Wilk Test Statistic	0.62
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.877	95% H-UCL	0.663
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.795
95% Adjusted-CLT UCL	0.943	97.5% Chebyshev (MVUE) UCL	0.911
95% Modified-t UCL	0.888	99% Chebyshev (MVUE) UCL	1.137
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.199	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.532		
nu star	115.1		
Approximate Chi Square Value (.05)	91.31	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	0.873
Adjusted Chi Square Value	90.65	95% Jackknife UCL	0.877
		95% Standard Bootstrap UCL	0.87
Anderson-Darling Test Statistic	9.6	95% Bootstrap-t UCL	1.091
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	0.828
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	0.872
Kolmogorov-Smirnov 5% Critical Value	0.131	95% BCA Bootstrap UCL	0.958
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.261
		97.5% Chebyshev(Mean, Sd) UCL	1.531
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.061
95% Approximate Gamma UCL	0.803		
95% Adjusted Gamma UCL	0.809		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.261

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples	48	Number of Unique Samples	44

Raw Statistics			Log-transformed Statistics		
	Minimum	8.15		Minimum of Log Data	2.098
	Maximum	68.7		Maximum of Log Data	4.23
	Mean	29.14		Mean of log Data	3.267
	Median	28		SD of log Data	0.465
	SD	13.88			
	Coefficient of Variation	0.476			
	Skewness	1.065			

Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.909		Shapiro Wilk Test Statistic	0.978
	Shapiro Wilk Critical Value	0.947		Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	32.5		95% H-UCL	33.16
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	38.06
	95% Adjusted-CLT UCL	32.77		97.5% Chebyshev (MVUE) UCL	41.92
	95% Modified-t UCL	32.55		99% Chebyshev (MVUE) UCL	49.49
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	4.618	Data appear Gamma Distributed at 5% Significance Level		
	Theta Star	6.31			
	nu star	443.3			
	Approximate Chi Square Value (.05)	395.5	Nonparametric Statistics		
	Adjusted Level of Significance	0.045		95% CLT UCL	32.44
	Adjusted Chi Square Value	394.1		95% Jackknife UCL	32.5
				95% Standard Bootstrap UCL	32.46
	Anderson-Darling Test Statistic	0.49		95% Bootstrap-t UCL	32.95
	Anderson-Darling 5% Critical Value	0.753		95% Hall's Bootstrap UCL	32.98
	Kolmogorov-Smirnov Test Statistic	0.109		95% Percentile Bootstrap UCL	32.54
	Kolmogorov-Smirnov 5% Critical Value	0.128		95% BCA Bootstrap UCL	32.94
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	37.87
				97.5% Chebyshev(Mean, Sd) UCL	41.65
				99% Chebyshev(Mean, Sd) UCL	49.08
Assuming Gamma Distribution					
	95% Approximate Gamma UCL	32.66			
	95% Adjusted Gamma UCL	32.78			
Potential UCL to Use				Use 95% Approximate Gamma UCL	32.66

Result or 1/2 SDL (toluene)

General Statistics					
	Number of Valid Samples	48		Number of Unique Samples	44
Raw Statistics			Log-transformed Statistics		
	Minimum	2.9700E-4		Minimum of Log Data	-8.122
	Maximum	0.0064		Maximum of Log Data	-5.051
	Mean	6.5492E-4		Mean of log Data	-7.638
	Median	3.6725E-4		SD of log Data	0.612

SD	9.3955E-4		
Coefficient of Variation	1.435		
Skewness	5.23		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.385	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.947	Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.8247E-4	95% H-UCL	6.9234E-4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.1723E-4
95% Adjusted-CLT UCL	9.8737E-4	97.5% Chebyshev (MVUE) UCL	9.2061E-4
95% Modified-t UCL	8.9953E-4	99% Chebyshev (MVUE) UCL	0.0011
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.68	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.8993E-4		
nu star	161.2		
Approximate Chi Square Value (.05)	132.9	Nonparametric Statistics	
Adjusted Level of Significance	0.045	95% CLT UCL	8.7798E-4
Adjusted Chi Square Value	132.1	95% Jackknife UCL	8.8247E-4
		95% Standard Bootstrap UCL	8.7005E-4
Anderson-Darling Test Statistic	7.505	95% Bootstrap-t UCL	0.0011
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	0.0016
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	8.8796E-4
Kolmogorov-Smirnov 5% Critical Value	0.13	95% BCA Bootstrap UCL	0.0010
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0012
		97.5% Chebyshev(Mean, Sd) UCL	0.0015
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.002
95% Approximate Gamma UCL	7.9468E-4		
95% Adjusted Gamma UCL	7.9947E-4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0012

Result or 1/2 SDL (vanadium)

General Statistics

Number of Valid Samples	48	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	9.02	Minimum of Log Data	2.199
Maximum	32	Maximum of Log Data	3.466
Mean	21.65	Mean of log Data	3.05
Median	21.75	SD of log Data	0.233
SD	4.554		
Coefficient of Variation	0.21		
Skewness	-0.279		

Relevant UCL Statistics

Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.985		Shapiro Wilk Test Statistic		0.933	
Shapiro Wilk Critical Value		0.947		Shapiro Wilk Critical Value		0.947	
Data appear Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		22.75		95% H-UCL		23.03	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		24.91	
95% Adjusted-CLT UCL		22.7		97.5% Chebyshev (MVUE) UCL		26.31	
95% Modified-t UCL		22.74		99% Chebyshev (MVUE) UCL		29.05	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		19.24		Data appear Normal at 5% Significance Level			
Theta Star		1.125					
nu star		1847					
Approximate Chi Square Value (.05)		1748		Nonparametric Statistics			
Adjusted Level of Significance		0.045		95% CLT UCL		22.73	
Adjusted Chi Square Value		1745		95% Jackknife UCL		22.75	
				95% Standard Bootstrap UCL		22.71	
Anderson-Darling Test Statistic		0.627		95% Bootstrap-t UCL		22.7	
Anderson-Darling 5% Critical Value		0.748		95% Hall's Bootstrap UCL		22.7	
Kolmogorov-Smirnov Test Statistic		0.102		95% Percentile Bootstrap UCL		22.73	
Kolmogorov-Smirnov 5% Critical Value		0.128		95% BCA Bootstrap UCL		22.76	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		24.51	
				97.5% Chebyshev(Mean, Sd) UCL		25.75	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		28.19	
95% Approximate Gamma UCL		22.87					
95% Adjusted Gamma UCL		22.91					
Potential UCL to Use				Use 95% Student's-t UCL		22.75	

Result or 1/2 SDL (zinc)

General Statistics			
Number of Valid Samples		53	
		Number of Unique Samples	
		53	
Raw Statistics		Log-transformed Statistics	
Minimum		Minimum of Log Data	
31.5		3.45	
Maximum		Maximum of Log Data	
903		6.806	
Mean		Mean of log Data	
139.1		4.558	
Median		SD of log Data	
84.3		0.795	
SD			
160.9			
Coefficient of Variation			
1.157			
Skewness			
2.989			

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic		Lilliefors Test Statistic	
0.28		0.133	
Lilliefors Critical Value		Lilliefors Critical Value	
0.122		0.122	
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	176.1	95% H-UCL	165.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	199.2
95% Adjusted-CLT UCL	185.2	97.5% Chebyshev (MVUE) UCL	229.1
95% Modified-t UCL	177.6	99% Chebyshev (MVUE) UCL	288
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.4	Data do not follow a Discernable Distribution (0.05)	
Theta Star	99.32		
nu star	148.4		
Approximate Chi Square Value (.05)	121.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0455	95% CLT UCL	175.5
Adjusted Chi Square Value	120.6	95% Jackknife UCL	176.1
		95% Standard Bootstrap UCL	175
Anderson-Darling Test Statistic	2.607	95% Bootstrap-t UCL	193.4
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	198.1
Kolmogorov-Smirnov Test Statistic	0.185	95% Percentile Bootstrap UCL	178.3
Kolmogorov-Smirnov 5% Critical Value	0.124	95% BCA Bootstrap UCL	187.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	235.5
		97.5% Chebyshev(Mean, Sd) UCL	277.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	359
95% Approximate Gamma UCL	170.2		
95% Adjusted Gamma UCL	171.2		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	235.5

APPENDIX A-9

POND SEDIMENT

												General UCL Statistics for Full Data Sets																			
User Selected Options																															
From File												J:\1352 - Gulfco R\risk\eco\draft for PRP review\Appendices\Data\Pond sediment data.wst																			
Full Precision												OFF																			
Confidence Coefficient												95%																			
Number of Bootstrap Operations												2000																			

Potential UCL to Use		Use 95% Student's-t UCL	0.0244
		or 95% Modified-t UCL	0.025
Result or 1/2 SDL (4,4'-ddd)			
General Statistics			
Number of Valid Samples	8	Number of Unique Samples	7
Raw Statistics		Log-transformed Statistics	
Minimum	2.2750E-4	Minimum of Log Data	-8.388
Maximum	0.013	Maximum of Log Data	-4.343
Mean	0.0069	Mean of log Data	-5.828
Median	0.01	SD of log Data	1.831
SD	0.0055		
Coefficient of Variation	0.794		
Skewness	-0.527		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.727
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0107	95% H-UCL	0.873
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0401
95% Adjusted-CLT UCL	0.0097	97.5% Chebyshev (MVUE) UCL	0.0529
95% Modified-t UCL	0.0106	99% Chebyshev (MVUE) UCL	0.0779
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.522	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0133		
nu star	8.359		
Approximate Chi Square Value (.05)	2.945	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0102
Adjusted Chi Square Value	2.195	95% Jackknife UCL	0.0107
		95% Standard Bootstrap UCL	0.0099
Anderson-Darling Test Statistic	1.169	95% Bootstrap-t UCL	0.0101
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.0092
Kolmogorov-Smirnov Test Statistic	0.388	95% Percentile Bootstrap UCL	0.0098
Kolmogorov-Smirnov 5% Critical Value	0.305	95% BCA Bootstrap UCL	0.0097
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0155
		97.5% Chebyshev(Mean, Sd) UCL	0.0192
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0264
95% Approximate Gamma UCL	0.0197		
95% Adjusted Gamma UCL	0.0265		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.0264
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (4,4'-ddt)			
General Statistics			
Number of Valid Samples	8	Number of Unique Samples	6
Raw Statistics		Log-transformed Statistics	
Minimum	0.0011	Minimum of Log Data	-6.803
Maximum	0.007	Maximum of Log Data	-4.962
Mean	0.0041	Mean of log Data	-5.717
Median	0.0055	SD of log Data	0.81
SD	0.0024		
Coefficient of Variation	0.588		
Skewness	-0.488		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.754
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0058	95% H-UCL	0.0116
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0098
95% Adjusted-CLT UCL	0.0054	97.5% Chebyshev (MVUE) UCL	0.0123
95% Modified-t UCL	0.0057	99% Chebyshev (MVUE) UCL	0.017
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.507	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0027		
nu star	24.12		
Approximate Chi Square Value (.05)	13.94	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0055
Adjusted Chi Square Value	12.03	95% Jackknife UCL	0.0058
		95% Standard Bootstrap UCL	0.0054
Anderson-Darling Test Statistic	1.03	95% Bootstrap-t UCL	0.0056
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	0.0052
Kolmogorov-Smirnov Test Statistic	0.37	95% Percentile Bootstrap UCL	0.0054
Kolmogorov-Smirnov 5% Critical Value	0.297	95% BCA Bootstrap UCL	0.0053
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0079
		97.5% Chebyshev(Mean, Sd) UCL	0.0095
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0128
95% Approximate Gamma UCL	0.0072		
95% Adjusted Gamma UCL	0.0083		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0079
Recommended UCL exceeds the maximum observation			
Result or 1/2 SDL (acetone)			
General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8

Raw Statistics				Log-transformed Statistics			
	Minimum	3.2850E-4			Minimum of Log Data	-8.021	
	Maximum	0.0798			Maximum of Log Data	-2.528	
	Mean	0.0238			Mean of log Data	-4.85	
	Median	0.0213			SD of log Data	2.123	
	SD	0.0264					
	Coefficient of Variation	1.11					
	Skewness	1.474					

Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
	Shapiro Wilk Test Statistic	0.845			Shapiro Wilk Test Statistic	0.849	
	Shapiro Wilk Critical Value	0.818			Shapiro Wilk Critical Value	0.818	
Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
	95% Student's-t UCL	0.0415			95% H-UCL	15.5	
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL	0.17	
	95% Adjusted-CLT UCL	0.0444			97.5% Chebyshev (MVUE) UCL	0.226	
	95% Modified-t UCL	0.0423			99% Chebyshev (MVUE) UCL	0.335	
Gamma Distribution Test				Data Distribution			
	k star (bias corrected)	0.434		Data appear Normal at 5% Significance Level			
	Theta Star	0.0549					
	nu star	6.942					
	Approximate Chi Square Value (.05)	2.139		Nonparametric Statistics			
	Adjusted Level of Significance	0.0195			95% CLT UCL	0.0392	
	Adjusted Chi Square Value	1.53			95% Jackknife UCL	0.0415	
					95% Standard Bootstrap UCL	0.0381	
	Anderson-Darling Test Statistic	0.394			95% Bootstrap-t UCL	0.0495	
	Anderson-Darling 5% Critical Value	0.758			95% Hall's Bootstrap UCL	0.108	
	Kolmogorov-Smirnov Test Statistic	0.201			95% Percentile Bootstrap UCL	0.0394	
	Kolmogorov-Smirnov 5% Critical Value	0.308			95% BCA Bootstrap UCL	0.0428	
Data appear Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL	0.0645	
					97.5% Chebyshev(Mean, Sd) UCL	0.0822	
					99% Chebyshev(Mean, Sd) UCL	0.117	
Assuming Gamma Distribution							
	95% Approximate Gamma UCL	0.0773					
	95% Adjusted Gamma UCL	0.108					
Potential UCL to Use					Use 95% Student's-t UCL	0.0415	

Result or 1/2 SDL (aluminum)

General Statistics							
	Number of Valid Samples	8			Number of Unique Samples	8	
Raw Statistics				Log-transformed Statistics			
	Minimum	7990			Minimum of Log Data	8.986	
	Maximum	16300			Maximum of Log Data	9.699	
	Mean	11748			Mean of log Data	9.334	

Median	11550	SD of log Data	0.293
SD	3382		
Coefficient of Variation	0.288		
Skewness	0.211		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk Test Statistic	0.89
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14013	95% H-UCL	14847
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17068
95% Adjusted-CLT UCL	13810	97.5% Chebyshev (MVUE) UCL	19369
95% Modified-t UCL	14028	99% Chebyshev (MVUE) UCL	23889
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.618	Data appear Normal at 5% Significance Level	
Theta Star	1363		
nu star	137.9		
Approximate Chi Square Value (.05)	111.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	13714
Adjusted Chi Square Value	105.8	95% Jackknife UCL	14013
		95% Standard Bootstrap UCL	13557
Anderson-Darling Test Statistic	0.421	95% Bootstrap-t UCL	14142
Anderson-Darling 5% Critical Value	0.715	95% Hall's Bootstrap UCL	13477
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	13574
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	13561
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16959
		97.5% Chebyshev(Mean, Sd) UCL	19214
		99% Chebyshev(Mean, Sd) UCL	23644
Assuming Gamma Distribution			
95% Approximate Gamma UCL	14494		
95% Adjusted Gamma UCL	15310		
Potential UCL to Use		Use 95% Student's-t UCL	14013

Result or 1/2 SDL (antimony)

General Statistics

Number of Valid Samples		8	Number of Unique Samples		7
Raw Statistics			Log-transformed Statistics		
Minimum	0.33		Minimum of Log Data	-1.109	
Maximum	1.85		Maximum of Log Data	0.615	
Mean	0.795		Mean of log Data	-0.487	
Median	0.4		SD of log Data	0.75	
SD	0.618				
Coefficient of Variation	0.778				
Skewness	0.887				

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk Test Statistic	0.765
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.209	95% H-UCL	1.849
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.7
95% Adjusted-CLT UCL	1.228	97.5% Chebyshev (MVUE) UCL	2.098
95% Modified-t UCL	1.221	99% Chebyshev (MVUE) UCL	2.879
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.392	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.571		
nu star	22.27		
Approximate Chi Square Value (.05)	12.54	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	1.154
Adjusted Chi Square Value	10.74	95% Jackknife UCL	1.209
		95% Standard Bootstrap UCL	1.128
Anderson-Darling Test Statistic	1.02	95% Bootstrap-t UCL	1.349
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	1.025
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	1.158
Kolmogorov-Smirnov 5% Critical Value	0.297	95% BCA Bootstrap UCL	1.173
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.748
		97.5% Chebyshev(Mean, Sd) UCL	2.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.97
95% Approximate Gamma UCL	1.412		
95% Adjusted Gamma UCL	1.648		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.748

Result or 1/2 SDL (arsenic)

General Statistics			
Number of Valid Samples		8	
		Number of Unique Samples	
		7	
Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	5.01	Maximum of Log Data	1.611
Mean	1.735	Mean of log Data	-0.633
Median	0.168	SD of log Data	1.74
SD	2.233		
Coefficient of Variation	1.287		
Skewness	0.794		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.706	Shapiro Wilk Test Statistic	0.695
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		3.231		95% H-UCL		92.47	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		6.274	
95% Adjusted-CLT UCL		3.27		97.5% Chebyshev (MVUE) UCL		8.245	
95% Modified-t UCL		3.268		99% Chebyshev (MVUE) UCL		12.12	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.415		Data do not follow a Discernable Distribution (0.05)			
Theta Star		4.176					
nu star		6.648					
Approximate Chi Square Value (.05)		1.979		Nonparametric Statistics			
Adjusted Level of Significance		0.0195		95% CLT UCL		3.034	
Adjusted Chi Square Value		1.401		95% Jackknife UCL		3.231	
				95% Standard Bootstrap UCL		2.918	
Anderson-Darling Test Statistic		1.258		95% Bootstrap-t UCL		4.026	
Anderson-Darling 5% Critical Value		0.76		95% Hall's Bootstrap UCL		2.692	
Kolmogorov-Smirnov Test Statistic		0.385		95% Percentile Bootstrap UCL		2.917	
Kolmogorov-Smirnov 5% Critical Value		0.308		95% BCA Bootstrap UCL		3.081	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		5.176	
				97.5% Chebyshev(Mean, Sd) UCL		6.665	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		9.59	
95% Approximate Gamma UCL		5.827					
95% Adjusted Gamma UCL		8.231					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		9.59	
Recommended UCL exceeds the maximum observation							
Result or 1/2 SDL (barium)							
General Statistics							
Number of Valid Samples		8		Number of Unique Samples		7	
Raw Statistics				Log-transformed Statistics			
Minimum		108		Minimum of Log Data		4.682	
Maximum		417		Maximum of Log Data		6.033	
Mean		198.6		Mean of log Data		5.149	
Median		128.5		SD of log Data		0.553	
SD		119.4					
Coefficient of Variation		0.601					
Skewness		1.058					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.787		Shapiro Wilk Test Statistic		0.803	
Shapiro Wilk Critical Value		0.818		Shapiro Wilk Critical Value		0.818	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		278.6		95% H-UCL		337.2	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		366.1	

95% Adjusted-CLT UCL	284.9	97.5% Chebyshev (MVUE) UCL	439.5
95% Modified-t UCL	281.2	99% Chebyshev (MVUE) UCL	583.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.374	Data do not follow a Discernable Distribution (0.05)	
Theta Star	83.68		
nu star	37.98		
Approximate Chi Square Value (.05)	24.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	268
Adjusted Chi Square Value	22.22	95% Jackknife UCL	278.6
		95% Standard Bootstrap UCL	262.5
Anderson-Darling Test Statistic	0.846	95% Bootstrap-t UCL	326.6
Anderson-Darling 5% Critical Value	0.72	95% Hall's Bootstrap UCL	250.9
Kolmogorov-Smirnov Test Statistic	0.3	95% Percentile Bootstrap UCL	263.6
Kolmogorov-Smirnov 5% Critical Value	0.296	95% BCA Bootstrap UCL	275.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	382.6
		97.5% Chebyshev(Mean, Sd) UCL	462.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	618.5
95% Approximate Gamma UCL	303.4		
95% Adjusted Gamma UCL	339.5		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	382.6

Result or 1/2 SDL (benzo(b)fluoranthene)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.106	Maximum of Log Data	-2.244
Mean	0.0477	Mean of log Data	-3.502
Median	0.0338	SD of log Data	1.186
SD	0.0385		
Coefficient of Variation	0.808		
Skewness	0.434		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0735	95% H-UCL	0.364
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.154
95% Adjusted-CLT UCL	0.0723	97.5% Chebyshev (MVUE) UCL	0.197
95% Modified-t UCL	0.0738	99% Chebyshev (MVUE) UCL	0.282
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.853	Data appear Normal at 5% Significance Level	

Theta Star	0.0559		
nu star	13.65		
Approximate Chi Square Value (.05)	6.332	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0701
Adjusted Chi Square Value	5.127	95% Jackknife UCL	0.0735
		95% Standard Bootstrap UCL	0.0679
Anderson-Darling Test Statistic	0.442	95% Bootstrap-t UCL	0.0754
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.0672
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	0.069
Kolmogorov-Smirnov 5% Critical Value	0.3	95% BCA Bootstrap UCL	0.0698
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.107
		97.5% Chebyshev(Mean, Sd) UCL	0.133
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.183
95% Approximate Gamma UCL	0.103		
95% Adjusted Gamma UCL	0.127		
Potential UCL to Use		Use 95% Student's-t UCL	0.0735

Result or 1/2 SDL (benzo(g,h,i)perylene)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	6
Raw Statistics		Log-transformed Statistics	
Minimum	0.0075	Minimum of Log Data	-4.893
Maximum	0.135	Maximum of Log Data	-2.002
Mean	0.024	Mean of log Data	-4.466
Median	0.0079	SD of log Data	1
SD	0.0449		
Coefficient of Variation	1.871		
Skewness	2.826		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.433	Shapiro Wilk Test Statistic	0.495
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.054	95% H-UCL	0.0711
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0449
95% Adjusted-CLT UCL	0.067	97.5% Chebyshev (MVUE) UCL	0.0568
95% Modified-t UCL	0.0567	99% Chebyshev (MVUE) UCL	0.0802
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.587	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0408		
nu star	9.393		
Approximate Chi Square Value (.05)	3.566	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.0501
Adjusted Chi Square Value	2.719	95% Jackknife UCL	0.054

				95% Standard Bootstrap UCL		0.0478	
Anderson-Darling Test Statistic		2.272		95% Bootstrap-t UCL		2.081	
Anderson-Darling 5% Critical Value		0.743		95% Hall's Bootstrap UCL		0.889	
Kolmogorov-Smirnov Test Statistic		0.49		95% Percentile Bootstrap UCL		0.0555	
Kolmogorov-Smirnov 5% Critical Value		0.303		95% BCA Bootstrap UCL		0.0716	
Data not Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		0.0931	
				97.5% Chebyshev(Mean, Sd) UCL		0.123	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		0.182	
95% Approximate Gamma UCL		0.0632					
95% Adjusted Gamma UCL		0.0828					
Potential UCL to Use				Use 99% Chebyshev (Mean, Sd) UCL		0.182	
Recommended UCL exceeds the maximum observation							
Result or 1/2 SDL (benzo(k)fluoranthene)							
General Statistics							
Number of Valid Samples		8		Number of Unique Samples		7	
Raw Statistics				Log-transformed Statistics			
Minimum		0.0115		Minimum of Log Data		-4.465	
Maximum		0.13		Maximum of Log Data		-2.04	
Mean		0.0527		Mean of log Data		-3.539	
Median		0.0138		SD of log Data		1.174	
SD		0.0557					
Coefficient of Variation		1.058					
Skewness		0.678					
Relevant UCL Statistics							
Normal Distribution Test				Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.695		Shapiro Wilk Test Statistic		0.702	
Shapiro Wilk Critical Value		0.818		Shapiro Wilk Critical Value		0.818	
Data not Normal at 5% Significance Level				Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		0.09		95% H-UCL		0.335	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL		0.146	
95% Adjusted-CLT UCL		0.0901		97.5% Chebyshev (MVUE) UCL		0.187	
95% Modified-t UCL		0.0908		99% Chebyshev (MVUE) UCL		0.267	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		0.691		Data do not follow a Discernable Distribution (0.05)			
Theta Star		0.0762					
nu star		11.06					
Approximate Chi Square Value (.05)		4.613		Nonparametric Statistics			
Adjusted Level of Significance		0.0195		95% CLT UCL		0.0851	
Adjusted Chi Square Value		3.619		95% Jackknife UCL		0.09	
				95% Standard Bootstrap UCL		0.0828	
Anderson-Darling Test Statistic		1.28		95% Bootstrap-t UCL		0.0975	
Anderson-Darling 5% Critical Value		0.737		95% Hall's Bootstrap UCL		0.071	
Kolmogorov-Smirnov Test Statistic		0.371		95% Percentile Bootstrap UCL		0.082	

Kolmogorov-Smirnov 5% Critical Value		0.302	95% BCA Bootstrap UCL		0.0834
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		0.139
			97.5% Chebyshev(Mean, Sd) UCL		0.176
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		0.249
95% Approximate Gamma UCL		0.126			
95% Adjusted Gamma UCL		0.161			
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL		0.249
Recommended UCL exceeds the maximum observation					
Result or 1/2 SDL (beryllium)					
General Statistics					
Number of Valid Samples		8	Number of Unique Samples		8
Raw Statistics			Log-transformed Statistics		
Minimum		0.58	Minimum of Log Data		-0.545
Maximum		1.13	Maximum of Log Data		0.122
Mean		0.834	Mean of log Data		-0.209
Median		0.865	SD of log Data		0.254
SD		0.206			
Coefficient of Variation		0.247			
Skewness		0.0408			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.926	Shapiro Wilk Test Statistic		0.916
Shapiro Wilk Critical Value		0.818	Shapiro Wilk Critical Value		0.818
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
95% Student's-t UCL		0.972	95% H-UCL		1.016
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		1.161
95% Adjusted-CLT UCL		0.954	97.5% Chebyshev (MVUE) UCL		1.303
95% Modified-t UCL		0.972	99% Chebyshev (MVUE) UCL		1.581
Gamma Distribution Test			Data Distribution		
k star (bias corrected)		11.5	Data appear Normal at 5% Significance Level		
Theta Star		0.0725			
nu star		183.9			
Approximate Chi Square Value (.05)		153.6	Nonparametric Statistics		
Adjusted Level of Significance		0.0195	95% CLT UCL		0.953
Adjusted Chi Square Value		146.5	95% Jackknife UCL		0.972
			95% Standard Bootstrap UCL		0.944
Anderson-Darling Test Statistic		0.371	95% Bootstrap-t UCL		0.963
Anderson-Darling 5% Critical Value		0.716	95% Hall's Bootstrap UCL		0.934
Kolmogorov-Smirnov Test Statistic		0.21	95% Percentile Bootstrap UCL		0.945
Kolmogorov-Smirnov 5% Critical Value		0.294	95% BCA Bootstrap UCL		0.939
Data appear Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		1.151
			97.5% Chebyshev(Mean, Sd) UCL		1.288
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1.557

95% Approximate Gamma UCL		0.999		
95% Adjusted Gamma UCL		1.047		
Potential UCL to Use			Use 95% Student's-t UCL	0.972
Result or 1/2 SDL (beta-bhc)				
General Statistics				
Number of Valid Samples		8	Number of Unique Samples 7	
Raw Statistics			Log-transformed Statistics	
	Minimum	2.4400E-4	Minimum of Log Data	-8.318
	Maximum	0.015	Maximum of Log Data	-4.2
	Mean	0.0079	Mean of log Data	-5.721
	Median	0.0115	SD of log Data	1.87
	SD	0.0063		
	Coefficient of Variation	0.799		
	Skewness	-0.521		
Relevant UCL Statistics				
Normal Distribution Test			Lognormal Distribution Test	
	Shapiro Wilk Test Statistic	0.771	Shapiro Wilk Test Statistic	0.725
	Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution			Assuming Lognormal Distribution	
	95% Student's-t UCL	0.0122	95% H-UCL	1.231
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL	0.0475
	95% Adjusted-CLT UCL	0.0112	97.5% Chebyshev (MVUE) UCL	0.0626
	95% Modified-t UCL	0.0122	99% Chebyshev (MVUE) UCL	0.0924
Gamma Distribution Test			Data Distribution	
	k star (bias corrected)	0.51	Data do not follow a Discernable Distribution (0.05)	
	Theta Star	0.0156		
	nu star	8.162		
Approximate Chi Square Value (.05)		2.829	Nonparametric Statistics	
	Adjusted Level of Significance	0.0195	95% CLT UCL	0.0117
	Adjusted Chi Square Value	2.098	95% Jackknife UCL	0.0122
			95% Standard Bootstrap UCL	0.0114
	Anderson-Darling Test Statistic	1.185	95% Bootstrap-t UCL	0.0116
	Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.0107
	Kolmogorov-Smirnov Test Statistic	0.39	95% Percentile Bootstrap UCL	0.0113
	Kolmogorov-Smirnov 5% Critical Value	0.305	95% BCA Bootstrap UCL	0.0112
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL	0.0178
			97.5% Chebyshev(Mean, Sd) UCL	0.022
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL	0.0303
	95% Approximate Gamma UCL	0.023		
	95% Adjusted Gamma UCL	0.031		
Potential UCL to Use			Use 99% Chebyshev (Mean, Sd) UCL	0.0303
Recommended UCL exceeds the maximum observation				

Result or 1/2 SDL (boron)			
General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	4.26	Minimum of Log Data	1.449
Maximum	28.4	Maximum of Log Data	3.346
Mean	14.95	Mean of log Data	2.439
Median	12.4	SD of log Data	0.817
SD	10.5		
Coefficient of Variation	0.702		
Skewness	0.337		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21.98	95% H-UCL	40.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	
95% Adjusted-CLT UCL	21.53	97.5% Chebyshev (MVUE) UCL	43.18
95% Modified-t UCL	22.06	99% Chebyshev (MVUE) UCL	59.77
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.355	Data appear Normal at 5% Significance Level	
Theta Star	11.03		
nu star	21.69		
Approximate Chi Square Value (.05)	12.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	21.06
Adjusted Chi Square Value	10.34	95% Jackknife UCL	21.98
		95% Standard Bootstrap UCL	20.6
Anderson-Darling Test Statistic	0.562	95% Bootstrap-t UCL	22.63
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	19.35
Kolmogorov-Smirnov Test Statistic	0.236	95% Percentile Bootstrap UCL	20.79
Kolmogorov-Smirnov 5% Critical Value	0.297	95% BCA Bootstrap UCL	20.78
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.13
		97.5% Chebyshev(Mean, Sd) UCL	38.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	51.87
95% Approximate Gamma UCL	26.79		
95% Adjusted Gamma UCL	31.36		
Potential UCL to Use		Use 95% Student's-t UCL	21.98
Result or 1/2 SDL (bromomethane)			
General Statistics			

Number of Valid Samples				8	Number of Unique Samples				8
Raw Statistics					Log-transformed Statistics				
	Minimum	0.0013				Minimum of Log Data	-6.63		
	Maximum	0.031				Maximum of Log Data	-3.474		
	Mean	0.0089				Mean of log Data	-5.269		
	Median	0.0067				SD of log Data	1.168		
	SD	0.0099							
	Coefficient of Variation	1.115							
	Skewness	1.87							
Relevant UCL Statistics									
Normal Distribution Test					Lognormal Distribution Test				
	Shapiro Wilk Test Statistic	0.777				Shapiro Wilk Test Statistic	0.9		
	Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value	0.818		
Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level				
Assuming Normal Distribution					Assuming Lognormal Distribution				
	95% Student's-t UCL	0.0156				95% H-UCL	0.058		
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	0.0256		
	95% Adjusted-CLT UCL	0.0172				97.5% Chebyshev (MVUE) UCL	0.0328		
	95% Modified-t UCL	0.016				99% Chebyshev (MVUE) UCL	0.0469		
Gamma Distribution Test					Data Distribution				
	k star (bias corrected)	0.737			Data appear Gamma Distributed at 5% Significance Level				
	Theta Star	0.0121							
	nu star	11.79							
	Approximate Chi Square Value (.05)	5.091			Nonparametric Statistics				
	Adjusted Level of Significance	0.0195				95% CLT UCL	0.0147		
	Adjusted Chi Square Value	4.035				95% Jackknife UCL	0.0156		
						95% Standard Bootstrap UCL	0.0142		
	Anderson-Darling Test Statistic	0.406				95% Bootstrap-t UCL	0.0234		
	Anderson-Darling 5% Critical Value	0.735				95% Hall's Bootstrap UCL	0.0427		
	Kolmogorov-Smirnov Test Statistic	0.226				95% Percentile Bootstrap UCL	0.0148		
	Kolmogorov-Smirnov 5% Critical Value	0.301				95% BCA Bootstrap UCL	0.0166		
Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	0.0242		
Assuming Gamma Distribution						97.5% Chebyshev(Mean, Sd) UCL	0.0309		
	95% Approximate Gamma UCL	0.0206				99% Chebyshev(Mean, Sd) UCL	0.0439		
	95% Adjusted Gamma UCL	0.0261							
Potential UCL to Use					Use 95% Approximate Gamma UCL				0.0206

Result or 1/2 SDL (cadmium)

General Statistics									
Number of Valid Samples				8	Number of Unique Samples				7
Raw Statistics					Log-transformed Statistics				
	Minimum	0.015				Minimum of Log Data	-4.2		
	Maximum	0.27				Maximum of Log Data	-1.309		

Mean	0.147	Mean of log Data	-2.491
Median	0.19	SD of log Data	1.377
SD	0.112		
Coefficient of Variation	0.762		
Skewness	-0.424		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.802	Shapiro Wilk Test Statistic	0.716
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.222	95% H-UCL	2.239
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.561
95% Adjusted-CLT UCL	0.206	97.5% Chebyshev (MVUE) UCL	0.727
95% Modified-t UCL	0.221	99% Chebyshev (MVUE) UCL	1.052
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.711	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.207		
nu star	11.37		
Approximate Chi Square Value (.05)	4.814	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.212
Adjusted Chi Square Value	3.794	95% Jackknife UCL	0.222
		95% Standard Bootstrap UCL	0.207
Anderson-Darling Test Statistic	1.11	95% Bootstrap-t UCL	0.211
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	0.195
Kolmogorov-Smirnov Test Statistic	0.35	95% Percentile Bootstrap UCL	0.208
Kolmogorov-Smirnov 5% Critical Value	0.301	95% BCA Bootstrap UCL	0.206
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.32
		97.5% Chebyshev(Mean, Sd) UCL	0.395
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.541
95% Approximate Gamma UCL	0.348		
95% Adjusted Gamma UCL	0.441		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	0.541
Recommended UCL exceeds the maximum observation			

Result or 1/2 SDL (carbon disulfide)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	9.5500E-5	Minimum of Log Data	-9.256
Maximum	0.0077	Maximum of Log Data	-4.865
Mean	0.0013	Mean of log Data	-7.554
Median	4.8175E-4	SD of log Data	1.364
SD	0.0025		
Coefficient of Variation	1.875		

				Skewness	2.757							
Relevant UCL Statistics												
Normal Distribution Test					Lognormal Distribution Test							
Shapiro Wilk Test Statistic				0.522	Shapiro Wilk Test Statistic				0.892			
Shapiro Wilk Critical Value				0.818	Shapiro Wilk Critical Value				0.818			
Data not Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level							
Assuming Normal Distribution					Assuming Lognormal Distribution							
95% Student's-t UCL				0.0031	95% H-UCL				0.0134			
95% UCLs (Adjusted for Skewness)					95% Chebyshev (MVUE) UCL				0.0034			
95% Adjusted-CLT UCL				0.0038	97.5% Chebyshev (MVUE) UCL				0.0045			
95% Modified-t UCL				0.0032	99% Chebyshev (MVUE) UCL				0.0065			
Gamma Distribution Test					Data Distribution							
k star (bias corrected)				0.48	Data Follow Appr. Gamma Distribution at 5% Significance Level							
Theta Star				0.0028								
nu star				7.688								
Approximate Chi Square Value (.05)				2.555	Nonparametric Statistics							
Adjusted Level of Significance				0.0195	95% CLT UCL				0.0028			
Adjusted Chi Square Value				1.871	95% Jackknife UCL				0.0031			
					95% Standard Bootstrap UCL				0.0027			
Anderson-Darling Test Statistic				0.892	95% Bootstrap-t UCL				0.0142			
Anderson-Darling 5% Critical Value				0.753	95% Hall's Bootstrap UCL				0.0134			
Kolmogorov-Smirnov Test Statistic				0.298	95% Percentile Bootstrap UCL				0.0031			
Kolmogorov-Smirnov 5% Critical Value				0.306	95% BCA Bootstrap UCL				0.0033			
Data follow Appr. Gamma Distribution at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL				0.0053			
					97.5% Chebyshev(Mean, Sd) UCL				0.0070			
Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL				0.0104			
95% Approximate Gamma UCL				0.0041								
95% Adjusted Gamma UCL				0.0056								
Potential UCL to Use					Use 95% Approximate Gamma UCL				0.0041			

General Statistics					
Number of Valid Samples		8	Number of Unique Samples		8
Raw Statistics			Log-transformed Statistics		
Minimum		8.29	Minimum of Log Data		2.115
Maximum		20.1	Maximum of Log Data		3.001
Mean		12.93	Mean of log Data		2.505
Median		11.55	SD of log Data		0.35
SD		4.611			
Coefficient of Variation		0.357			
Skewness		0.57			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
Shapiro Wilk Test Statistic		0.881	Shapiro Wilk Test Statistic		0.895

Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.02	95% H-UCL	17.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.93
95% Adjusted-CLT UCL	15.97	97.5% Chebyshev (MVUE) UCL	22.96
95% Modified-t UCL	16.08	99% Chebyshev (MVUE) UCL	28.91
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.937	Data appear Normal at 5% Significance Level	
Theta Star	2.178		
nu star	94.99		
Approximate Chi Square Value (.05)	73.51	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	15.61
Adjusted Chi Square Value	68.75	95% Jackknife UCL	16.02
		95% Standard Bootstrap UCL	15.41
Anderson-Darling Test Statistic	0.448	95% Bootstrap-t UCL	16.66
Anderson-Darling 5% Critical Value	0.715	95% Hall's Bootstrap UCL	15.32
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	15.5
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	15.63
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.04
		97.5% Chebyshev(Mean, Sd) UCL	23.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29.15
95% Approximate Gamma UCL	16.71		
95% Adjusted Gamma UCL	17.87		
Potential UCL to Use		Use 95% Student's-t UCL	16.02

Result or 1/2 SDL (chrysene)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.0065	Minimum of Log Data	-5.036
Maximum	0.0257	Maximum of Log Data	-3.661
Mean	0.0094	Mean of log Data	-4.785
Median	0.007	SD of log Data	0.462
SD	0.0065		
Coefficient of Variation	0.697		
Skewness	2.777		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.577
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0139	95% H-UCL	0.0139

95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.0157
95% Adjusted-CLT UCL	0.0157	97.5% Chebyshev (MVUE) UCL		0.0186
95% Modified-t UCL	0.0143	99% Chebyshev (MVUE) UCL		0.0242
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	2.693	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0035			
nu star	43.09			
Approximate Chi Square Value (.05)	29.04	Nonparametric Statistics		
Adjusted Level of Significance	0.0195	95% CLT UCL		0.0133
Adjusted Chi Square Value	26.16	95% Jackknife UCL		0.0139
		95% Standard Bootstrap UCL		0.013
Anderson-Darling Test Statistic	1.788	95% Bootstrap-t UCL		0.0588
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL		0.037
Kolmogorov-Smirnov Test Statistic	0.395	95% Percentile Bootstrap UCL		0.014
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL		0.0144
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0196
		97.5% Chebyshev(Mean, Sd) UCL		0.024
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.0327
95% Approximate Gamma UCL	0.014			
95% Adjusted Gamma UCL	0.0156			
Potential UCL to Use		Use 95% Student's-t UCL		0.0139
		or 95% Modified-t UCL		0.0143
Result or 1/2 SDL (cobalt)				
General Statistics				
Number of Valid Samples	8	Number of Unique Samples	8	
Raw Statistics		Log-transformed Statistics		
Minimum	5.19	Minimum of Log Data	1.647	
Maximum	8.99	Maximum of Log Data	2.196	
Mean	6.939	Mean of log Data	1.92	
Median	6.945	SD of log Data	0.2	
SD	1.378			
Coefficient of Variation	0.199			
Skewness	0.167			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.945	
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818	
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	7.862	95% H-UCL	8.067	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.086	
95% Adjusted-CLT UCL	7.771	97.5% Chebyshev (MVUE) UCL	10.02	
95% Modified-t UCL	7.866	99% Chebyshev (MVUE) UCL	11.84	

Gamma Distribution Test				Data Distribution			
k star (bias corrected)		18.1	Data appear Normal at 5% Significance Level				
Theta Star		0.383					
nu star		289.5					
Approximate Chi Square Value (.05)		251.1	Nonparametric Statistics				
Adjusted Level of Significance		0.0195			95% CLT UCL	7.74	
Adjusted Chi Square Value		242			95% Jackknife UCL	7.862	
					95% Standard Bootstrap UCL	7.683	
Anderson-Darling Test Statistic		0.268			95% Bootstrap-t UCL	7.852	
Anderson-Darling 5% Critical Value		0.716			95% Hall's Bootstrap UCL	7.642	
Kolmogorov-Smirnov Test Statistic		0.197			95% Percentile Bootstrap UCL	7.689	
Kolmogorov-Smirnov 5% Critical Value		0.294			95% BCA Bootstrap UCL	7.689	
Data appear Gamma Distributed at 5% Significance Level					95% Chebyshev(Mean, Sd) UCL	9.062	
					97.5% Chebyshev(Mean, Sd) UCL	9.981	
Assuming Gamma Distribution					99% Chebyshev(Mean, Sd) UCL	11.79	
95% Approximate Gamma UCL		8					
95% Adjusted Gamma UCL		8.3					
Potential UCL to Use					Use 95% Student's-t UCL	7.862	

Result or 1/2 SDL (copper)

General Statistics			
Number of Valid Samples		8	Number of Unique Samples 8
Raw Statistics		Log-transformed Statistics	
Minimum	8.33	Minimum of Log Data	2.12
Maximum	26.8	Maximum of Log Data	3.288
Mean	15.2	Mean of log Data	2.623
Median	12.55	SD of log Data	0.467
SD	7.421		
Coefficient of Variation	0.488		
Skewness	0.836		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20.17	95% H-UCL	23.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.14
95% Adjusted-CLT UCL	20.34	97.5% Chebyshev (MVUE) UCL	30.9
95% Modified-t UCL	20.3	99% Chebyshev (MVUE) UCL	40.26

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.353	Data appear Normal at 5% Significance Level	
Theta Star	4.533		
nu star	53.65		
Approximate Chi Square Value (.05)	37.82	Nonparametric Statistics	

Adjusted Level of Significance	0.0195	95% CLT UCL	19.51
Adjusted Chi Square Value	34.49	95% Jackknife UCL	20.17
		95% Standard Bootstrap UCL	19.15
Anderson-Darling Test Statistic	0.476	95% Bootstrap-t UCL	23.91
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	21.16
Kolmogorov-Smirnov Test Statistic	0.192	95% Percentile Bootstrap UCL	19.18
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	19.81
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.64
		97.5% Chebyshev(Mean, Sd) UCL	31.58
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.31
95% Approximate Gamma UCL	21.56		
95% Adjusted Gamma UCL	23.64		
Potential UCL to Use		Use 95% Student's-t UCL	20.17

Result or 1/2 SDL (Iron)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	11300	Minimum of Log Data	9.333
Maximum	20100	Maximum of Log Data	9.908
Mean	15275	Mean of log Data	9.614
Median	15500	SD of log Data	0.214
SD	3227		
Coefficient of Variation	0.211		
Skewness	0.139		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17437	95% H-UCL	17970
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20327
95% Adjusted-CLT UCL	17212	97.5% Chebyshev (MVUE) UCL	22512
95% Modified-t UCL	17446	99% Chebyshev (MVUE) UCL	26805
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.92	Data appear Normal at 5% Significance Level	
Theta Star	959.6		
nu star	254.7		
Approximate Chi Square Value (.05)	218.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	17152
Adjusted Chi Square Value	210.3	95% Jackknife UCL	17437
		95% Standard Bootstrap UCL	16994
Anderson-Darling Test Statistic	0.298	95% Bootstrap-t UCL	17461
Anderson-Darling 5% Critical Value	0.716	95% Hall's Bootstrap UCL	16993

Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	17025
Kolmogorov-Smirnov 5% Critical Value	0.294	95% BCA Bootstrap UCL	17050
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20249
		97.5% Chebyshev(Mean, Sd) UCL	22401
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26629
95% Approximate Gamma UCL	17786		
95% Adjusted Gamma UCL	18500		
Potential UCL to Use		Use 95% Student's-t UCL	17437

Result or 1/2 SDL (lead)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	10.6	Minimum of Log Data	2.361
Maximum	30.5	Maximum of Log Data	3.418
Mean	17.54	Mean of log Data	2.798
Median	15.5	SD of log Data	0.384
SD	7.076		
Coefficient of Variation	0.403		
Skewness	0.923		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.28	95% H-UCL	24.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.92
95% Adjusted-CLT UCL	22.52	97.5% Chebyshev (MVUE) UCL	32.44
95% Modified-t UCL	22.41	99% Chebyshev (MVUE) UCL	41.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.874	Data appear Normal at 5% Significance Level	
Theta Star	3.598		
nu star	77.99		
Approximate Chi Square Value (.05)	58.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	21.65
Adjusted Chi Square Value	54.42	95% Jackknife UCL	22.28
		95% Standard Bootstrap UCL	21.37
Anderson-Darling Test Statistic	0.324	95% Bootstrap-t UCL	23.69
Anderson-Darling 5% Critical Value	0.717	95% Hall's Bootstrap UCL	22.55
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	21.63
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	22.26
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.44
		97.5% Chebyshev(Mean, Sd) UCL	33.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.43

95% Approximate Gamma UCL		23.32			
95% Adjusted Gamma UCL		25.13			
Potential UCL to Use			Use 95% Student's-t UCL		22.28
Result or 1/2 SDL (lithium)					
General Statistics					
Number of Valid Samples		8	Number of Unique Samples		8
Raw Statistics			Log-transformed Statistics		
	Minimum	13.5		Minimum of Log Data	2.603
	Maximum	23.7		Maximum of Log Data	3.165
	Mean	18.48		Mean of log Data	2.895
	Median	18.85		SD of log Data	0.225
	SD	4.071			
	Coefficient of Variation	0.22			
	Skewness	0.0036			
Relevant UCL Statistics					
Normal Distribution Test			Lognormal Distribution Test		
	Shapiro Wilk Test Statistic	0.903		Shapiro Wilk Test Statistic	0.897
	Shapiro Wilk Critical Value	0.818		Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level			Data appear Lognormal at 5% Significance Level		
Assuming Normal Distribution			Assuming Lognormal Distribution		
	95% Student's-t UCL	21.2		95% H-UCL	21.95
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL	24.92
	95% Adjusted-CLT UCL	20.84		97.5% Chebyshev (MVUE) UCL	27.7
	95% Modified-t UCL	21.2		99% Chebyshev (MVUE) UCL	33.17
Gamma Distribution Test			Data Distribution		
	k star (bias corrected)	14.45	Data appear Normal at 5% Significance Level		
	Theta Star	1.278			
	nu star	231.2			
	Approximate Chi Square Value (.05)	197	Nonparametric Statistics		
	Adjusted Level of Significance	0.0195		95% CLT UCL	20.84
	Adjusted Chi Square Value	189		95% Jackknife UCL	21.2
				95% Standard Bootstrap UCL	20.67
	Anderson-Darling Test Statistic	0.416		95% Bootstrap-t UCL	21.17
	Anderson-Darling 5% Critical Value	0.716		95% Hall's Bootstrap UCL	20.56
	Kolmogorov-Smirnov Test Statistic	0.22		95% Percentile Bootstrap UCL	20.65
	Kolmogorov-Smirnov 5% Critical Value	0.294		95% BCA Bootstrap UCL	20.68
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL	24.75
				97.5% Chebyshev(Mean, Sd) UCL	27.46
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL	32.8
	95% Approximate Gamma UCL	21.68			
	95% Adjusted Gamma UCL	22.6			
Potential UCL to Use			Use 95% Student's-t UCL		21.2

Result or 1/2 SDL (m,p-cresol)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	7
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Raw Statistics

Log-transformed Statistics

Minimum	0.0105	Minimum of Log Data	-4.556
Maximum	0.0375	Maximum of Log Data	-3.283
Mean	0.0149	Mean of log Data	-4.31
Median	0.0117	SD of log Data	0.424
SD	0.0092		
Coefficient of Variation	0.619		
Skewness	2.758		

Relevant UCL Statistics

Normal Distribution Test

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.523	Shapiro Wilk Test Statistic	0.61
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818

Data not Normal at 5% Significance Level

Data not Lognormal at 5% Significance Level

Assuming Normal Distribution

Assuming Lognormal Distribution

95% Student's-t UCL	0.021	95% H-UCL	0.0211
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95% UCLs (Adjusted for Skewness)

95% Chebyshev (MVUE) UCL	0.0241
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95% Adjusted-CLT UCL	0.0236	97.5% Chebyshev (MVUE) UCL	0.0282
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95% Modified-t UCL	0.0216	99% Chebyshev (MVUE) UCL	0.0363
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Gamma Distribution Test

Data Distribution

k star (bias corrected)	3.242	Data do not follow a Discernable Distribution (0.05)
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Theta Star	0.0045
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nu star	51.87
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Approximate Chi Square Value (.05)	36.33
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Nonparametric Statistics

Adjusted Level of Significance	0.0195	95% CLT UCL	0.0202
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Adjusted Chi Square Value	33.07	95% Jackknife UCL	0.021
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95% Standard Bootstrap UCL	0.02
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Anderson-Darling Test Statistic	1.626	95% Bootstrap-t UCL	0.0564
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Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	0.0455
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Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	0.0212
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Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	0.0244
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Data not Gamma Distributed at 5% Significance Level

95% Chebyshev(Mean, Sd) UCL	0.0291
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97.5% Chebyshev(Mean, Sd) UCL	0.0352
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Assuming Gamma Distribution

99% Chebyshev(Mean, Sd) UCL	0.0472
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95% Approximate Gamma UCL	0.0212
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95% Adjusted Gamma UCL	0.0233
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Potential UCL to Use

Use 95% Student's-t UCL	0.021
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or 95% Modified-t UCL	0.0216
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Result or 1/2 SDL (manganese)

General Statistics

Number of Valid Samples				8	Number of Unique Samples				8
Raw Statistics					Log-transformed Statistics				
	Minimum	352				Minimum of Log Data	5.864		
	Maximum	711				Maximum of Log Data	6.567		
	Mean	487.6				Mean of log Data	6.162		
	Median	453				SD of log Data	0.247		
	SD	124.2							
	Coefficient of Variation	0.255							
	Skewness	0.739							
Relevant UCL Statistics									
Normal Distribution Test					Lognormal Distribution Test				
	Shapiro Wilk Test Statistic	0.921				Shapiro Wilk Test Statistic	0.941		
	Shapiro Wilk Critical Value	0.818				Shapiro Wilk Critical Value	0.818		
Data appear Normal at 5% Significance Level					Data appear Lognormal at 5% Significance Level				
Assuming Normal Distribution					Assuming Lognormal Distribution				
	95% Student's-t UCL	570.8				95% H-UCL	590.3		
95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	673.6		
	95% Adjusted-CLT UCL	572.1				97.5% Chebyshev (MVUE) UCL	754.2		
	95% Modified-t UCL	572.7				99% Chebyshev (MVUE) UCL	912.6		
Gamma Distribution Test					Data Distribution				
	k star (bias corrected)	11.66			Data appear Normal at 5% Significance Level				
	Theta Star	41.81							
	nu star	186.6							
	Approximate Chi Square Value (.05)	156			Nonparametric Statistics				
	Adjusted Level of Significance	0.0195				95% CLT UCL	559.8		
	Adjusted Chi Square Value	148.9				95% Jackknife UCL	570.8		
						95% Standard Bootstrap UCL	556		
	Anderson-Darling Test Statistic	0.297				95% Bootstrap-t UCL	592.1		
	Anderson-Darling 5% Critical Value	0.716				95% Hall's Bootstrap UCL	575		
	Kolmogorov-Smirnov Test Statistic	0.171				95% Percentile Bootstrap UCL	560.3		
	Kolmogorov-Smirnov 5% Critical Value	0.294				95% BCA Bootstrap UCL	567		
Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	679		
Assuming Gamma Distribution						97.5% Chebyshev(Mean, Sd) UCL	761.8		
	95% Approximate Gamma UCL	583.3				99% Chebyshev(Mean, Sd) UCL	924.4		
	95% Adjusted Gamma UCL	611							
Potential UCL to Use						Use 95% Student's-t UCL	570.8		

Result or 1/2 SDL (methyl iodide)

General Statistics									
Number of Valid Samples				8	Number of Unique Samples				8
Raw Statistics					Log-transformed Statistics				
	Minimum	7.9500E-4				Minimum of Log Data	-7.137		
	Maximum	0.041				Maximum of Log Data	-3.194		

Mean	0.0081	Mean of log Data	-5.689
Median	0.0039	SD of log Data	1.357
SD	0.0135		
Coefficient of Variation	1.669		
Skewness	2.624		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0172	95% H-UCL	0.0836
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0222
95% Adjusted-CLT UCL	0.0207	97.5% Chebyshev (MVUE) UCL	0.0288
95% Modified-t UCL	0.0179	99% Chebyshev (MVUE) UCL	0.0416
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.516	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0157		
nu star	8.249		
Approximate Chi Square Value (.05)	2.88	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.016
Adjusted Chi Square Value	2.141	95% Jackknife UCL	0.0172
		95% Standard Bootstrap UCL	0.0154
Anderson-Darling Test Statistic	0.64	95% Bootstrap-t UCL	0.0493
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	0.0518
Kolmogorov-Smirnov Test Statistic	0.232	95% Percentile Bootstrap UCL	0.0172
Kolmogorov-Smirnov 5% Critical Value	0.305	95% BCA Bootstrap UCL	0.0188
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.029
		97.5% Chebyshev(Mean, Sd) UCL	0.038
		99% Chebyshev(Mean, Sd) UCL	0.0558
Assuming Gamma Distribution			
95% Approximate Gamma UCL	0.0232		
95% Adjusted Gamma UCL	0.0313		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0232

Result or 1/2 SDL (molybdenum)

General Statistics

Number of Valid Samples		8	Number of Unique Samples		5
Raw Statistics			Log-transformed Statistics		
Minimum	0.055		Minimum of Log Data	-2.9	
Maximum	0.6		Maximum of Log Data	-0.511	
Mean	0.146		Mean of log Data	-2.382	
Median	0.06		SD of log Data	0.881	
SD	0.191				
Coefficient of Variation	1.312				
Skewness	2.461				

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Data appear Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
Assuming Normal Distribution				Assuming Lognormal Distribution			
95% Student's-t UCL		18.4		95% H-UCL		18.87	
95% UCLs (Adjusted for Skewness)				95% Chebyshev (MVUE) UCL			
95% Adjusted-CLT UCL		18.1		97.5% Chebyshev (MVUE) UCL		23.31	
95% Modified-t UCL		18.39		99% Chebyshev (MVUE) UCL		27.46	
Gamma Distribution Test				Data Distribution			
k star (bias corrected)		19.56		Data appear Normal at 5% Significance Level			
Theta Star		0.835					
nu star		312.9					
Approximate Chi Square Value (.05)		272.9		Nonparametric Statistics			
Adjusted Level of Significance		0.0195		95% CLT UCL		18.12	
Adjusted Chi Square Value		263.5		95% Jackknife UCL		18.4	
				95% Standard Bootstrap UCL		18.04	
Anderson-Darling Test Statistic		0.362		95% Bootstrap-t UCL		18.49	
Anderson-Darling 5% Critical Value		0.716		95% Hall's Bootstrap UCL		17.89	
Kolmogorov-Smirnov Test Statistic		0.218		95% Percentile Bootstrap UCL		17.96	
Kolmogorov-Smirnov 5% Critical Value		0.294		95% BCA Bootstrap UCL		17.91	
Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		21.09	
				97.5% Chebyshev(Mean, Sd) UCL		23.15	
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		27.2	
95% Approximate Gamma UCL		18.72					
95% Adjusted Gamma UCL		19.39					
Potential UCL to Use				Use 95% Student's-t UCL		18.4	

Result or 1/2 SDL (pyrene)

General Statistics			
Number of Valid Samples		8	Number of Unique Samples
			6
Raw Statistics		Log-transformed Statistics	
Minimum	0.009	Minimum of Log Data	-4.711
Maximum	0.0265	Maximum of Log Data	-3.631
Mean	0.0147	Mean of log Data	-4.32
Median	0.0105	SD of log Data	0.469
SD	0.0073		
Coefficient of Variation	0.497		
Skewness	0.806		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic		Shapiro Wilk Test Statistic	0.788
Shapiro Wilk Critical Value		Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL		95% H-UCL	0.0225
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0253

95% Adjusted-CLT UCL	0.0197	97.5% Chebyshev (MVUE) UCL	0.0299
95% Modified-t UCL	0.0197	99% Chebyshev (MVUE) UCL	0.039
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.283	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0044		
nu star	52.53		
Approximate Chi Square Value (.05)	36.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	0.019
Adjusted Chi Square Value	33.6	95% Jackknife UCL	0.0196
		95% Standard Bootstrap UCL	0.0188
Anderson-Darling Test Statistic	0.881	95% Bootstrap-t UCL	0.0216
Anderson-Darling 5% Critical Value	0.719	95% Hall's Bootstrap UCL	0.0178
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	0.019
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	0.0191
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.026
		97.5% Chebyshev(Mean, Sd) UCL	0.0308
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0404
95% Approximate Gamma UCL	0.021		
95% Adjusted Gamma UCL	0.023		
Potential UCL to Use		Use 95% Approximate Gamma UCL	0.021

Result or 1/2 SDL (strontium)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	63.3	Minimum of Log Data	4.148
Maximum	181	Maximum of Log Data	5.198
Mean	103.6	Mean of log Data	4.575
Median	89.45	SD of log Data	0.38
SD	41.82		
Coefficient of Variation	0.404		
Skewness	1		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	131.6	95% H-UCL	142.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	164.1
95% Adjusted-CLT UCL	133.5	97.5% Chebyshev (MVUE) UCL	190.5
95% Modified-t UCL	132.5	99% Chebyshev (MVUE) UCL	242.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.946	Data appear Normal at 5% Significance Level	

Theta Star	20.94		
nu star	79.14		
Approximate Chi Square Value (.05)	59.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	127.9
Adjusted Chi Square Value	55.38	95% Jackknife UCL	131.6
		95% Standard Bootstrap UCL	126.2
Anderson-Darling Test Statistic	0.349	95% Bootstrap-t UCL	145.3
Anderson-Darling 5% Critical Value	0.717	95% Hall's Bootstrap UCL	138.1
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	127.7
Kolmogorov-Smirnov 5% Critical Value	0.295	95% BCA Bootstrap UCL	132.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	168.1
		97.5% Chebyshev(Mean, Sd) UCL	195.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	250.7
95% Approximate Gamma UCL	137.5		
95% Adjusted Gamma UCL	148		
Potential UCL to Use		Use 95% Student's-t UCL	131.6

Result or 1/2 SDL (titanium)

General Statistics			
Number of Valid Samples	8	Number of Unique Samples	8
Raw Statistics		Log-transformed Statistics	
Minimum	19.1	Minimum of Log Data	2.95
Maximum	40.5	Maximum of Log Data	3.701
Mean	30	Mean of log Data	3.367
Median	32.65	SD of log Data	0.286
SD	8.035		
Coefficient of Variation	0.268		
Skewness	-0.263		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical Value	0.818	Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.38	95% H-UCL	37.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43.33
95% Adjusted-CLT UCL	34.39	97.5% Chebyshev (MVUE) UCL	49.08
95% Modified-t UCL	35.34	99% Chebyshev (MVUE) UCL	60.37
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.311	Data appear Normal at 5% Significance Level	
Theta Star	3.222		
nu star	149		
Approximate Chi Square Value (.05)	121.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0195	95% CLT UCL	34.67
Adjusted Chi Square Value	115.5	95% Jackknife UCL	35.38

[illegible]

Result or 1/2 SDL (vanadium)

General Statistics

Number of Valid Samples	8	Number of Unique Samples	8
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Raw Statistics

Minimum	16.8
Maximum	27.4
Mean	21.83
Median	21.8
SD	4.107
of Variation	0.188
Skewness	0.0796

Log-transformed Statistics

Minimum of Log Data	2.821
Maximum of Log Data	3.311
Mean of log Data	3.067
SD of log Data	0.19

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.818

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.818

Data appear Normal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Assuming Normal Distribution

95% Student's-t UCL 24.58

Assuming Lognormal Distribution

95% H-UCL 25.16

95% UCLs (Adjusted for Skewness)

95% Adjusted-CLT UCL 24.26

95% Chebyshev (MVUE) UCL

97.5% Chebyshev (MVUE) UCL 31.02

95% Modified-t UCL 24.58

99% Chebyshev (MVUE) UCL 36.47

Gamma Distribution Test

k star (bias corrected) 20.05

Data Distribution

Data appear Normal at 5% Significance Level

Theta Star 1.089

Approximate Chi Square Value (.05)

Adjusted Level of Significance 0.0195

Nonparametric Statistics

95% CLT UCL 24.21

Adjusted Chi Square Value 270.7

95% Jackknife UCL 24.58

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 104

5% Standard Bootstrap UCL	24.07
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Anderson-Darling Test Statistic 0.392

95% Bootstrap-t UCL 24.63

Anderson-Darling 5% Critical Value 0.71695% Hall's Bootstrap UCL 23.78Kolmogorov-Smirnov Test Statistic 0.222Percentile Bootstrap UCL 24.1

Data appear Gamma Distributed at 5% Significance Level				95% Chebyshev(Mean, Sd) UCL		28.15
				97.5% Chebyshev(Mean, Sd) UCL		30.89
Assuming Gamma Distribution				99% Chebyshev(Mean, Sd) UCL		36.27
95% Approximate Gamma UCL		24.98				
95% Adjusted Gamma UCL		25.87				
Potential UCL to Use				Use 95% Student's-t UCL		24.58
Result or 1/2 SDL (zinc)						
General Statistics						
Number of Valid Samples		8	Number of Unique Samples		8	
Raw Statistics			Log-transformed Statistics			
Minimum		38.2	Minimum of Log Data		3.643	
Maximum		999	Maximum of Log Data		6.907	
Mean		332.3	Mean of log Data		4.894	
Median		55.65	SD of log Data		1.489	
SD		407.7				
Coefficient of Variation		1.227				
Skewness		0.879				
Relevant UCL Statistics						
Normal Distribution Test			Lognormal Distribution Test			
Shapiro Wilk Test Statistic		0.737	Shapiro Wilk Test Statistic		0.746	
Shapiro Wilk Critical Value		0.818	Shapiro Wilk Critical Value		0.818	
Data not Normal at 5% Significance Level			Data not Lognormal at 5% Significance Level			
Assuming Normal Distribution			Assuming Lognormal Distribution			
95% Student's-t UCL		605.4	95% H-UCL		6104	
95% UCLs (Adjusted for Skewness)			95% Chebyshev (MVUE) UCL		1069	
95% Adjusted-CLT UCL		617.3	97.5% Chebyshev (MVUE) UCL		1392	
95% Modified-t UCL		612.9	99% Chebyshev (MVUE) UCL		2027	
Gamma Distribution Test			Data Distribution			
k star (bias corrected)		0.5	Data do not follow a Discernable Distribution (0.05)			
Theta Star		664.4				
nu star		8.002				
Approximate Chi Square Value (.05)		2.736	Nonparametric Statistics			
Adjusted Level of Significance		0.0195	95% CLT UCL		569.4	
Adjusted Chi Square Value		2.021	95% Jackknife UCL		605.4	
			95% Standard Bootstrap UCL		557.7	
Anderson-Darling Test Statistic		1.087	95% Bootstrap-t UCL		766.5	
Anderson-Darling 5% Critical Value		0.751	95% Hall's Bootstrap UCL		474.6	
Kolmogorov-Smirnov Test Statistic		0.365	95% Percentile Bootstrap UCL		570.5	
Kolmogorov-Smirnov 5% Critical Value		0.306	95% BCA Bootstrap UCL		594.2	
Data not Gamma Distributed at 5% Significance Level			95% Chebyshev(Mean, Sd) UCL		960.7	
			97.5% Chebyshev(Mean, Sd) UCL		1233	
Assuming Gamma Distribution			99% Chebyshev(Mean, Sd) UCL		1767	
95% Approximate Gamma UCL		971.8				
95% Adjusted Gamma UCL		1316				

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ANTIMONY - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.118	1.228	83	0.953	0.878	10

Calculated Difference = 0.165
 Standard Error of the Difference = 0.407177285
 Degree of Freedom = 91
 t = 0.405228892
 p = 0.3445
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 background mean is not statistically less than site mean

ARSENIC - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	3.735	4.012	83	3.438	1.792	10

Calculated Difference = 0.297
 Standard Error of the Difference = 1.126036589
 Degree of Freedom = 91
 t = 0.263756971
 p = 0.3963
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

BARIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	345.2	349	83	333.1	288.1	10

Calculated Difference = 12.1
 Standard Error of the Difference = 124.3580544
 Degree of Freedom = 91
 t = 0.097299689
 p = 0.4614 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

CADMIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.464	1.141	83	0.0311	0.0398	10

Calculated Difference = 0.4329
 Standard Error of the Difference = 0.277019204
 Degree of Freedom = 91
 t = 1.562707545
 p = 0.0608 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

CHROMIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	16.08	15.7	83	15.2	3.02	10

Calculated Difference = 0.88
 Standard Error of the Difference = 3.925742193
 Degree of Freedom = 91
 t = 0.224161434
 p = 0.4116
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

COPPER - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	27.98	35.35	83	12.12	3.955	10

Calculated Difference = 15.86
 Standard Error of the Difference = 8.664375822
 Degree of Freedom = 91
 t = 1.830483849
 p = 0.0353
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is statistically greater than background mean

LEAD - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	69.61	112.8	83	13.43	1.547	10

Calculated Difference = 56.18
 Standard Error of the Difference = 27.36239203
 Degree of Freedom = 91
 t = 2.053183068
 p = 0.0215
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is statistically greater than background mean

LITHIUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	7.856	5.715	83	21.14	5.166	10

Calculated Difference = 13.284
 Standard Error of the Difference = 2.142429492
 Degree of Freedom = 91
 t = 6.200437423
 p = 0.00 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically less than background mean

MANGANESE - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	257.4	129.3	83	377.4	93.75	10

Calculated Difference = 120
 Standard Error of the Difference = 43.15491673
 Degree of Freedom = 91
 t = 2.780679679
 p = 0.0033 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically less than background mean

MERCURY - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0227	0.0752	83	0.0213	0.00479	10

Calculated Difference = 0.0014
 Standard Error of the Difference = 0.01830147
 Degree of Freedom = 91
 t = 0.076496585
 p = 0.4698
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

MOLYBDENUM - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	1.306	1.588	83	0.522	0.0739	10

Calculated Difference = 0.784
 Standard Error of the Difference = 0.385854899
 Degree of Freedom = 91
 t = 2.031851873
 p = 0.0225 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically greater than background mean

ZINC - SOUTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	601.2	672.8	83	247	364.6	10

Calculated Difference = 354.2
 Standard Error of the Difference = 199.8008143
 Degree of Freedom = 91
 t = 1.772765547
 p = 0.0399 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically greater than background mean

ANTIMONY - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.023	1.14	166	0.953	0.878	10

Calculated Difference = 0.07
 Standard Error of the Difference = 0.39183601
 Degree of Freedom = 174
 t = 0.178646164
 p = 0.4292
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 background mean is not statistically less than site mean

ARSENIC - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	3.331	3.269	166	3.438	1.792	10

Calculated Difference = 0.107
 Standard Error of the Difference = 0.97454393
 Degree of Freedom = 174
 t = 0.109794948
 p = 0.4563
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

BARIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	237.4	274.8	166	333.1	288.1	10

Calculated Difference = 95.7
 Standard Error of the Difference = 112.8814519
 Degree of Freedom = 174
 t = 0.847792072
 p = 0.1989 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically less than background mean

CADMIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.335	0.859	166	0.0311	0.0398	10

Calculated Difference = 0.3039
 Standard Error of the Difference = 0.208717917
 Degree of Freedom = 174
 t = 1.456032165
 p = 0.0736
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

CHROMIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	13.53	12.49	166	15.2	3.02	10

Calculated Difference = 1.67
 Standard Error of the Difference = 3.176242508
 Degree of Freedom = 174
 t = 0.525778493
 p = 0.2998
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

COPPER - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	24.26	46.76	166	12.12	3.955	10

Calculated Difference = 12.14
 Standard Error of the Difference = 11.40971991
 Degree of Freedom = 174
 t = 1.064005085
 p = 0.1444
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

LEAD - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	53.52	104.2	166	13.43	1.547	10

Calculated Difference = 40.09
 Standard Error of the Difference = 25.27694655
 Degree of Freedom = 174
 t = 1.586030177
 p = 0.0573
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is not statistically greater than background mean

LITHIUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	10.03	6.299	166	21.14	5.166	10

Calculated Difference = 11.11
 Standard Error of the Difference = 2.236676187
 Degree of Freedom = 174
 t = 4.967191972
 p = 0.00 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically less than background mean

MANGANESE - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	261.2	127.4	166	377.4	93.75	10

Calculated Difference = 116.2
 Standard Error of the Difference = 42.82121949
 Degree of Freedom = 174
 t = 2.713607912
 p = 0.0037 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically less than background mean

MERCURY - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0262	0.0941	166	0.0213	0.00479	10

Calculated Difference = 0.0049
 Standard Error of the Difference = 0.022872813
 Degree of Freedom = 174
 t = 0.214228129
 p = 0.4153
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

MOLYBDENUM - SOUTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.89	1.488	166	0.522	0.0739	10

Calculated Difference = 0.368
 Standard Error of the Difference = 0.361648843
 Degree of Freedom = 174
 t = 1.017561668
 p = 0.1550 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

ZINC - SOUTH OF MARLIN SOIL						
Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	433.8	786.8	166	247	364.6	10
<p>Calculated Difference = 186.8</p> <p>Standard Error of the Difference = 222.9535182</p> <p>Degree of Freedom = 174</p> <p>t = 0.8378428</p> <p>p = 0.2016</p> <p>Data sets significantly different = No</p> <p>calculated at www.stat.tamu.edu/~west/applets/tdemo.html</p> <p>site soil mean is not statistically greater than background mean</p>						

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	433.8	786.8	166	247	364.6	10

Calculated Difference =	186.8	
Standard Error of the Difference =	222.9535182	
Degree of Freedom =	174	
t =	0.8378428	
p =	0.2016	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically greater than background mean

ANTIMONY - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.744	2.146	18	0.953	0.878	10

Calculated Difference = 0.791
 Standard Error of the Difference = 0.589906214
 Degree of Freedom = 26
 t = 1.340891114
 p = 0.0958 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

ARSENIC - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	2.522	1.164	18	3.438	1.792	10

Calculated Difference = 0.916
 Standard Error of the Difference = 0.633108336
 Degree of Freedom = 26
 t = 1.446829789
 p = 0.0799
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

BARIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	145.2	115.8	18	333.1	288.1	10

Calculated Difference = 187.9
 Standard Error of the Difference = 95.33605484
 Degree of Freedom = 26
 t = 1.970922756
 p = 0.0297 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically less than background mean

CADMIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.207	0.252	18	0.0311	0.0398	10

Calculated Difference = 0.1759
 Standard Error of the Difference = 0.06240139
 Degree of Freedom = 26
 t = 2.818847487
 p = 0.0045
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically greater than background mean

CHROMIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	20.26	27.58	18	15.2	3.02	10

Calculated Difference = 5.06
 Standard Error of the Difference = 6.7569619
 Degree of Freedom = 26
 t = 0.748857264
 p = 0.2303
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

COPPER - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	24.13	44.66	18	12.12	3.955	10

Calculated Difference = 12.01
 Standard Error of the Difference = 10.90360718
 Degree of Freedom = 26
 t = 1.101470348
 p = 0.1405 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

LEAD - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	57.7	111.1	18	13.43	1.547	10

Calculated Difference = 44.27
 Standard Error of the Difference = 26.95014837
 Degree of Freedom = 26
 t = 1.64266257
 p = 0.0562 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site surface soil mean is not statistically greater than background mean

LITHIUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	16.57	5.136	18	21.14	5.166	10

Calculated Difference = 4.57
 Standard Error of the Difference = 2.054368963
 Degree of Freedom = 26
 t = 2.224527377
 p = 0.0175 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically less than background mean

MANGANESE - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	369.5	247.7	18	377.4	93.75	10

Calculated Difference = 7.9
 Standard Error of the Difference = 66.99284257
 Degree of Freedom = 26
 t = 0.117923045
 p = 0.4535 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site surface soil mean is not statistically less than background mean

MERCURY - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0126	0.0163	18	0.0213	0.00479	10

Calculated Difference = 0.0087
 Standard Error of the Difference = 0.004233584
 Degree of Freedom = 26
 t = 2.054996426
 p = 0.0250 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site soil mean is statistically less than background mean

MOLYBDENUM - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.949	2.5	18	0.522	0.0739	10

Calculated Difference = 0.427
 Standard Error of the Difference = 0.606789238
 Degree of Freedom = 26
 t = 0.703703977
 p = 0.2439
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ZINC - NORTH OF MARLIN SURFACE SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	418.4	1308	18	247	364.6	10

Calculated Difference = 171.4
 Standard Error of the Difference = 337.5387012
 Degree of Freedom = 26
 t = 0.507793623
 p = 0.3080
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ANTIMONY - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.416	1.779	36	0.953	0.878	10

Calculated Difference = 0.463
 Standard Error of the Difference = 0.513084318
 Degree of Freedom = 44
 t = 0.902385794
 p = 0.1859
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ARSENIC - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	2.573	1.369	36	3.438	1.792	10

Calculated Difference = 0.865
 Standard Error of the Difference = 0.656788524
 Degree of Freedom = 44
 t = 1.317014486
 p = 0.0973
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

BARIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	142.1	95.9	36	333.1	288.1	10

Calculated Difference = 191
 Standard Error of the Difference = 94.02738869
 Degree of Freedom = 44
 t = 2.031323029
 p = 0.0242 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different = Yes site surface soil mean is statistically less than background mean

CADMIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.193	0.239	36	0.0311	0.0398	10

Calculated Difference = 0.1619
 Standard Error of the Difference = 0.059316632
 Degree of Freedom = 44
 t = 2.729419974
 p = 0.0045
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically greater than background mean

CHROMIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	17.17	19.6	36	15.2	3.02	10

Calculated Difference = 1.97
 Standard Error of the Difference = 4.848678898
 Degree of Freedom = 44
 t = 0.406296239
 p = 0.3432
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

COPPER - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	18.7	31.9	36	12.12	3.955	10

Calculated Difference = 6.58
 Standard Error of the Difference = 7.837321881
 Degree of Freedom = 44
 t = 0.83957251
 p = 0.2028
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

LEAD - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	37.8	80.99	36	13.43	1.547	10

Calculated Difference = 24.37
 Standard Error of the Difference = 19.6490511
 Degree of Freedom = 44
 t = 1.240263455
 p = 0.1108 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site surface soil mean is not statistically greater than background mean

LITHIUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	18.84	5.952	36	21.14	5.166	10

Calculated Difference = 2.3
 Standard Error of the Difference = 2.180058677
 Degree of Freedom = 44
 t = 1.055017475
 p = 0.1486
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

MANGANESE - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	347	204.1	36	377.4	93.75	10

Calculated Difference = 30.4
 Standard Error of the Difference = 57.70014591
 Degree of Freedom = 44
 t = 0.526861753
 p = 0.3005
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is not statistically less than background mean

MERCURY - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0094	0.0124	36	0.0213	0.00479	10

Calculated Difference = 0.0119
 Standard Error of the Difference = 0.00336736
 Degree of Freedom = 44
 t = 3.533925295
 p = 0.0005 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site soil mean is statistically less than background mean

MOLYBDENUM - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.586	1.788	36	0.522	0.0739	10

Calculated Difference = 0.064
 Standard Error of the Difference = 0.434282915
 Degree of Freedom = 44
 t = 0.147369371
 p = 0.4417
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ZINC - NORTH OF MARLIN SOIL

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	242.5	929.4	36	247	364.6	10

Calculated Difference =	4.5	
Standard Error of the Difference =	253.1879948	
Degree of Freedom =	44	
t =	0.017773355	
p =	0.4929	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

ZINC - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	45.36	19.88	16	36.04	13.68	9

Calculated Difference = 9.32
 Standard Error of the Difference = 6.477819531
 Degree of Freedom = 23
 t = 1.438755735
 p = 0.0818
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

4,4'-DDT - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
4,4'-DDT	0.00041103	0.0007962	17	0.0001555	0.00015569	9

Calculated Difference = 0.00025553
 Standard Error of the Difference = 0.000199284
 Degree of Freedom = 24
 t = 1.28223903
 p = 0.106
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ALUMINUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Aluminum	6854	2346	16	12213	6892	9

Calculated Difference = 5359
 Standard Error of the Difference = 2252.49071
 Degree of Freedom = 23
 t = 2.379144107
 p = 0.013
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

ANTIMONY - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	2.245	1.751	16	4.023	2.215	9

Calculated Difference = 1.778
 Standard Error of the Difference = 0.819130942
 Degree of Freedom = 23
 t = 2.170593136
 p = 0.0203
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

ARSENIC - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	4.026	1.4	16	5.813	3.107	9

Calculated Difference = 1.787
 Standard Error of the Difference = 1.039537887
 Degree of Freedom = 23
 t = 1.719033066
 p = 0.0495
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

BARIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	215.3	59.65	16	209.7	47.73	9

Calculated Difference = 5.6
 Standard Error of the Difference = 20.90733397
 Degree of Freedom = 23
 t = 0.267848594
 p = 0.3956
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

BENZO(B)FLUORANTHENE - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Benzo(b)fluoranthene	0.1	0.157	16	0.0087	0.0106	9

Calculated Difference = 0.0913
 Standard Error of the Difference = 0.038225347
 Degree of Freedom = 23
 t = 2.388467508
 p = 0.5 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

BERYLLIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Beryllium	0.463	0.149	16	0.766	0.403	9

Calculated Difference = 0.303
 Standard Error of the Difference = 0.13246449
 Degree of Freedom = 23
 t = 2.287405473
 p = 0.0159 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site soil mean is statistically less than background mean

BORON - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Boron	12.04	9.92	16	27.64	12.82	9

Calculated Difference = 15.6
 Standard Error of the Difference = 4.714218044
 Degree of Freedom = 23
 t = 3.30913841
 p = 0.0015
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

COBALT - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cobalt	4.385	1.131	16	6.698	3.165	9

Calculated Difference = 2.313
 Standard Error of the Difference = 1.037770333
 Degree of Freedom = 23
 t = 2.228816845
 p = 0.0179 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site soil mean is statistically less than background mean

COPPER - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	7.112	2.997	16	8.138	5.165	9

Calculated Difference = 1.026
 Standard Error of the Difference = 1.787757246
 Degree of Freedom = 23
 t = 0.573903421
 p = 0.2858 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically less than background mean

IRON - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Iron	13352	5546	16	16496	8097	9

Calculated Difference = 3144
 Standard Error of the Difference = 2892.307356
 Degree of Freedom = 23
 t = 1.087021403
 p = 0.1441
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

LEAD - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	11.56	7.161	16	9.587	3.602	9

Calculated Difference = 1.973
 Standard Error of the Difference = 2.076994545
 Degree of Freedom = 23
 t = 0.949930275
 p = 0.1760
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

LITHIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	10.53	3.559	16	21.4	14.41	9

Calculated Difference = 10.87
 Standard Error of the Difference = 4.637876359
 Degree of Freedom = 23
 t = 2.343745102
 p = 0.0141 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site soil mean is statistically less than background mean

MANGANESE - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	283.3	87.59	16	330.7	88.99	9

Calculated Difference = 47.4
 Standard Error of the Difference = 35.25927685
 Degree of Freedom = 23
 t = 1.34432706
 p = 0.0960
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

MERCURY - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0201	0.0073	16	0.0176	0.0132	9

Calculated Difference = 0.0025
 Standard Error of the Difference = 0.004534171
 Degree of Freedom = 23
 t = 0.551368717
 p = 0.5000 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = No site soil mean is not statistically greater than background mean

MOLYBDENUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.667	1.358	16	0.241	0.0675	9

Calculated Difference = 0.426
 Standard Error of the Difference = 0.330054329
 Degree of Freedom = 23
 t = 1.290696598
 p = 0.1048
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

NICKEL - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Nickel	9.589	2.741	16	14.91	8.111	9

Calculated Difference = 5.321
 Standard Error of the Difference = 2.649675082
 Degree of Freedom = 23
 t = 2.008170751
 p = 0.5000
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

STRONTIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Strontium	44.86	14.43	16	59.17	22.06	9

Calculated Difference = 14.31
 Standard Error of the Difference = 7.804670623
 Degree of Freedom = 23
 t = 1.833517478
 p = 0.0398
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

TITANIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Titanium	25.58	5.051	16	31.79	10.49	9

Calculated Difference = 6.21
 Standard Error of the Difference = 3.536205768
 Degree of Freedom = 23
 t = 1.756119527
 p = 0.0462
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

VANADIUM - INTRACOASTAL WATERWAY SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Vanadium	13.86	3.523	16	20.21	9.135	9

Calculated Difference = 6.35
 Standard Error of the Difference = 3.012459534
 Degree of Freedom = 23
 t = 2.107912133
 p = 0.0231
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

ANTIMONY - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	1.154	0.724	47	0.953	0.878	10

Calculated Difference = 0.201
 Standard Error of the Difference = 0.32851527
 Degree of Freedom = 55
 t = 0.611843706
 p = 0.2716
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ARSENIC - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	2.534	2.465	48	3.438	1.792	10

Calculated Difference = 0.904
 Standard Error of the Difference = 0.823742314
 Degree of Freedom = 56
 t = 1.097430573
 p = 0.1387
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

BARIUM - WETLAND SEDIMENT	
1	100
2	100
3	100
4	100
5	100
6	100
7	100
8	100
9	100
10	100
11	100
12	100
13	100
14	100
15	100
16	100
17	100
18	100
19	100
20	100
21	100
22	100
23	100
24	100
25	100
26	100
27	100
28	100
29	100
30	100
31	100
32	100
33	100
34	100
35	100
36	100
37	100
38	100
39	100
40	100
41	100
42	100
43	100
44	100
45	100
46	100
47	100
48	100
49	100
50	100
51	100
52	100
53	100
54	100
55	100
56	100
57	100
58	100
59	100
60	100
61	100
62	100
63	100
64	100
65	100
66	100
67	100
68	100
69	100
70	100
71	100
72	100
73	100
74	100
75	100
76	100
77	100
78	100
79	100
80	100
81	100
82	100
83	100
84	100
85	100
86	100
87	100
88	100
89	100
90	100
91	100
92	100
93	100
94	100
95	100
96	100
97	100
98	100
99	100
100	100

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	151.7	136.5	48	333.1	288.1	10

Calculated Difference =	181.4	
Standard Error of the Difference =	96.93387285	
Degree of Freedom =	56	
t =	1.871378855	
p =	0.0333	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	Yes	site surface soil mean is statistically less than background mean

CADMIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.103	0.146	48	0.0311	0.0398	10

Calculated Difference = 0.0719
 Standard Error of the Difference = 0.037580399
 Degree of Freedom = 56
 t = 1.913231441
 p = 0.0304
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically greater than background mean

CHROMIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	15.07	5.536	48	15.2	3.02	10

Calculated Difference = 0.13
 Standard Error of the Difference = 1.647671726
 Degree of Freedom = 56
 t = 0.078899211
 p = 0.4687
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

COPPER - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	14.49	8.49	48	12.12	3.955	10

Calculated Difference = 2.37
 Standard Error of the Difference = 2.409192475
 Degree of Freedom = 56
 t = 0.983732111
 p = 0.1647
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

LEAD - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	25.36	34.13	48	13.43	1.547	10

Calculated Difference = 11.93
 Standard Error of the Difference = 8.292183972
 Degree of Freedom = 56
 t = 1.438704211
 p = 0.0779
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is not statistically greater than background mean

LITHIUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	18.65	3.754	48	21.14	5.166	10

Calculated Difference = 2.49
 Standard Error of the Difference = 1.870221145
 Degree of Freedom = 56
 t = 1.331393353
 p = 0.0943
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

MANGANESE - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	331.8	205.9	48	377.4	93.75	10

Calculated Difference = 45.6
 Standard Error of the Difference = 58.07511173
 Degree of Freedom = 56
 t = 0.785190052
 p = 0.2178
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is not statistically less than background mean

MERCURY - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Mercury	0.0199	0.0194	48	0.0213	0.00479	10

Calculated Difference = 0.0014
 Standard Error of the Difference = 0.004942998
 Degree of Freedom = 56
 t = 0.283228898
 p = 0.3890
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is not statistically less than background mean

MOLYBDENUM - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.581	0.677	48	0.522	0.0739	10

Calculated Difference = 0.059
 Standard Error of the Difference = 0.16585129
 Degree of Freedom = 56
 t = 0.355740374
 p = 0.3617
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

ZINC - WETLAND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	139.1	160.9	53	247	364.6	10

Calculated Difference = 107.9
 Standard Error of the Difference = 121.7217613
 Degree of Freedom = 61
 t = 0.886447902
 p = 0.1896
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

ANTIMONY - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Antimony	0.795	0.618	8	0.953	0.878	10

Calculated Difference = 0.158
 Standard Error of the Difference = 0.31552261
 Degree of Freedom = 16
 t = 0.500756506
 p = 0.3116
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

ARSENIC - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Arsenic	1.735	2.233	8	3.438	1.792	10

Calculated Difference = 1.703
 Standard Error of the Difference = 0.783860649
 Degree of Freedom = 16
 t = 2.172580039
 p = 0.0226 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site soil mean is statistically less than background mean

BARIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Barium	198.6	119.4	8	333.1	288.1	10

Calculated Difference = 134.5
 Standard Error of the Difference = 95.59691633
 Degree of Freedom = 16
 t = 1.406949148
 p = 0.0893
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is not statistically less than background mean

CADMIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Cadmium	0.147	0.112	8	0.0311	0.0398	10

Calculated Difference = 0.1159
 Standard Error of the Difference = 0.029938042
 Degree of Freedom = 16
 t = 3.871328672
 p = 0.0007
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically greater than background mean

CHROMIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Chromium	12.93	4.611	8	15.2	3.02	10

Calculated Difference =	2.27	
Standard Error of the Difference =	1.470614137	
Degree of Freedom =	16	
t =	1.543572812	
p =	0.0711	calculated at www.stat.tamu.edu/~west/applets/tdemo.html
Data sets significantly different =	No	site soil mean is not statistically less than background mean

COPPER - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Copper	15.2	7.421	8	12.12	3.955	10

Calculated Difference = 3.08
 Standard Error of the Difference = 2.191731568
 Degree of Freedom = 16
 t = 1.40528158
 p = 0.0896
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

LEAD - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lead	17.54	7.076	8	13.43	1.547	10

Calculated Difference = 4.11
 Standard Error of the Difference = 1.784545276
 Degree of Freedom = 16
 t = 2.303107719
 p = 0.0175 calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 Data sets significantly different = Yes site surface soil mean is statistically greater than background mean

LITHIUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Lithium	18.48	4.071	8	21.14	5.166	10

Calculated Difference = 2.66
 Standard Error of the Difference = 1.908832199
 Degree of Freedom = 16
 t = 1.393522176
 p = 0.0912
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically less than background mean

MANGANESE - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Manganese	487.6	124.2	8	377.4	93.75	10

Calculated Difference = 110.2
 Standard Error of the Difference = 42.26460503
 Degree of Freedom = 16
 t = 2.607382701
 p = 0.0095
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site surface soil mean is statistically greater than background mean

MOLYBDENUM - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Molybdenum	0.146	0.191	8	0.522	0.0739	10

Calculated Difference = 0.376
 Standard Error of the Difference = 0.051885086
 Degree of Freedom = 16
 t = 7.24678375
 p = 0.0000
 Data sets significantly different = Yes

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is statistically less than background mean

ZINC - POND SEDIMENT

Compound	Site Conc. Mean	Site Conc. Standard Deviation	Number of Site Samples	Background Conc. Mean	Background Conc. Standard Deviation	Number of Background Samples
Zinc	332.3	407.7	8	247	364.6	10

Calculated Difference = 85.3
 Standard Error of the Difference = 151.8911495
 Degree of Freedom = 16
 t = 0.561586375
 p = 0.2910
 Data sets significantly different = No

calculated at www.stat.tamu.edu/~west/applets/tdemo.html
 site soil mean is not statistically greater than background mean

APPENDIX C

INTAKE CALCULATIONS

TABLE C-1
EXPOSURE POINT CONCENTRATION (mg/kg) FOR COPCs
SOIL SOUTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
4,4-DDD	0.00766		0.0498	97.5% Chebyshev
Aluminum	6452		6914	95% Student's-t
Aroclor-1254	0.205		0.74	97.5% Chebyshev
Benzo(a)anthracene	0.268		0.859	99% Chebyshev
Benzo(a)pyrene	0.347		1.008	99% Chebyshev
Benzo(b)fluoranthene	0.466		1.256	99% Chebyshev
Benzo(k)fluoranthene	0.157		0.378	97.5% Chebyshev
Dibenz(a,h)anthracene	0.113		0.236	97.5% Chebyshev
Dieldrin	0.00090075		0.0021	97.5% Chebyshev
Indeno(1,2,3-cd)pyrene	0.368		0.761	97.5% Chebyshev
Iron	14277		17453	95% Chebyshev
Isopropylbenzene (cumene)	0.831		8.618	99% Chebyshev
Lead	53.52		104	97.5% Chebyshev
Napthalene	0.323		2.775	99% Chebyshev

TABLE C-2
EXPOSURE POINT CONCENTRATION (mg/kg) FOR COPCs
SURFACE SOIL SOUTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
4,4-DDD	0.0007894		0.0029	97.5% Chebyshev
Aluminum	5335		5946	95% Student's-t
Aroclor-1254	0.137		0.726	97.5% Chebyshev
Benzo(a)anthracene	0.345		1.211	99% Chebyshev
Benzo(a)pyrene	0.457		1.457	99% Chebyshev
Benzo(b)fluoranthene	0.582		1.638	95% H-UCL
Benzo(k)fluoranthene	0.24		0.651	97.5% Chebyshev
Dibenz(a,h)anthracene	0.155		0.363	97.5% Chebyshev
Dieldrin	0.000997		0.003	97.5% Chebyshev
Indeno(1,2,3-cd)pyrene	0.47		1.115	97.5% Chebyshev
Iron	16285		17845	95% H-UCL
Isopropylbenzene (cumene)				
Lead	69.61		84.5	95% H-UCL
Napthalene				

TABLE C-3
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AVERAGE – YOUTH TRESPASSER

SOIL INGESTION				
INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)				
Parameter	Definition	Value	Reference	
Intake	Intake of chemical (mg/kg-day)	calculated		
Sc	Soil concentration (mg/kg)	see data page		
Ac	Air concentration (mg/m^3)	see below		
EAC	Effective air concentration (mg/m^3)	calculated		
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a	
IR	Ingestion rate of soil (mg/day)	100	TNRCC, 1998	
SA	Skin surface area (cm2)	3500	TNRCC, 1998	
AF	Soil to skin adherence factor (mg/cm2)	0.1	TNRCC, 1998	
ABSd	Dermal absorption fraction (unitless)	see chemprop page		
EF	Exposure frequency (day/yr)	25	professional judgment	
ED	Exposure duration (yr)	6	professional judgment	
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989	
BW	Body weight (kg)	40	EPA, 1991a	
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989	
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989	

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	7.66E-03	1.12E-10	3.15E-10
Aluminum	6.45E+03	9.47E-05	2.65E-04
Aroclor-1254	2.05E-01	3.01E-09	8.42E-09
Benzo(a)anthracene	2.68E-01	3.93E-09	1.10E-08
Benzo(a)pyrene	3.47E-01	5.09E-09	1.43E-08
Benzo(b)fluoranthene	4.68E-01	6.84E-09	1.92E-08
Benzo(k)fluoranthene	1.57E-01	2.30E-09	6.45E-09
Dibenz(a,h)anthracene	1.13E-01	1.68E-09	4.64E-09
Dieldrin	9.01E-04	1.32E-11	3.70E-11
Indeno(1,2,3-cd)pyrene	3.68E-01	5.40E-09	1.51E-08
Iron	1.43E+04	2.10E-04	5.87E-04
Isopropylbenzene (cumene)	8.31E-01	1.22E-08	3.42E-08
Lead	5.35E+01	7.86E-07	2.20E-06
Napthalene	3.23E-01	4.74E-09	1.33E-08

DERMAL CONTACT				
INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)				
Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	1.30E-01	7.66E-03	5.12E-11	1.43E-10
Aluminum	1.00E-02	6.45E+03	3.31E-06	9.28E-06
Aroclor-1254	1.40E-01	2.05E-01	1.47E-09	4.13E-09
Benzo(a)anthracene	1.30E-01	2.68E-01	1.79E-09	5.01E-09
Benzo(a)pyrene	1.30E-01	3.47E-01	2.32E-09	6.49E-09
Benzo(b)fluoranthene	1.30E-01	4.68E-01	3.11E-09	8.71E-09
Benzo(k)fluoranthene	1.30E-01	1.57E-01	1.05E-09	2.94E-09
Dibenz(a,h)anthracene	1.30E-01	1.13E-01	7.55E-10	2.11E-09
Dieldrin	1.30E-01	9.01E-04	6.02E-12	1.68E-11
Indeno(1,2,3-cd)pyrene	1.30E-01	3.68E-01	2.46E-09	6.88E-09
Iron	1.00E-02	1.43E+04	7.33E-06	2.05E-05
Isopropylbenzene (cumene)	1.30E-01	8.31E-01	5.55E-09	1.55E-08
Lead	1.00E-02	5.35E+01	2.75E-08	7.70E-08
Napthalene	1.30E-01	3.23E-01	2.16E-09	6.04E-09

INHALATION PATHWAY				
Ac =	Sc * (1/PEF)			
EAC =	(Ac * EF * ED) / AT			
*for carcinogens, a conversion is necessary to get into proper units, ug/m3				
Chemical	Sc	Ac	EAC for Carcinogens	EAC for Noncarcinogens
4,4-DDD	7.89E-04	7.89E-13	4.63E-12	1.30E-14
Aluminum	5.34E+03	5.34E-06	3.13E-05	8.77E-08
Aroclor-1254	1.37E-01	1.37E-10	8.04E-10	2.25E-12
Benzo(a)anthracene	3.45E-01	3.45E-10	2.03E-09	5.67E-12
Benzo(a)pyrene	4.57E-01	4.57E-10	2.68E-09	7.51E-12
Benzo(b)fluoranthene	5.82E-01	5.82E-10	3.42E-09	9.57E-12
Benzo(k)fluoranthene	2.40E-01	2.40E-10	1.41E-09	3.95E-12
Dibenz(a,h)anthracene	1.55E-01	1.55E-10	9.10E-10	2.55E-12
Dieldrin	9.97E-04	9.97E-13	5.85E-12	1.64E-14
Indeno(1,2,3-cd)pyrene	4.70E-01	4.70E-10	2.76E-09	7.73E-12
Iron	1.63E+04	1.63E-05	9.56E-05	2.68E-07
Isopropylbenzene (cumene)	8.31E-01	8.31E-10	4.88E-09	1.37E-11
Lead	6.96E+01	6.96E-08	4.09E-07	1.14E-09
Napthalene	3.23E-01	3.23E-10	1.90E-09	5.31E-12

TABLE C-4
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RME -- YOUTH TRESPASSER (age 6 to 18)

SOIL INGESTION			
INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)			
Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m ³)	see below	
EAC	Effective air concentration (mg/m ³)	calculated	
PEF	Particulate Emission Factor (m ³ /kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	100	TNRCC, 1998
SA	Skin surface area (cm ²)	3500	TNRCC, 1998
AF	Soil to skin adherence factor (mg/cm ²)	0.1	TNRCC, 1998
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	50	TNRCC, 1998
ED	Exposure duration (yr)	12	TNRCC, 1998
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	40	EPA, 1991a
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	4.98E-02	2.92E-09	8.19E-09
Aluminum	6.91E+03	4.06E-04	1.14E-03
Aroclor-1254	7.40E-01	4.34E-08	1.22E-07
Benzo(a)anthracene	8.59E-01	5.04E-08	1.41E-07
Benzo(a)pyrene	1.01E+00	5.92E-08	1.66E-07
Benzo(b)fluoranthene	1.26E+00	7.37E-08	2.06E-07
Benzo(k)fluoranthene	3.78E-01	2.22E-08	6.21E-08
Dibenz(a,h)anthracene	2.36E-01	1.39E-08	3.88E-08
Dieldrin	2.10E-03	1.23E-10	3.45E-10
Indeno(1,2,3-cd)pyrene	7.61E-01	4.47E-08	1.25E-07
Iron	1.75E+04	1.02E-03	2.87E-03
Isopropylbenzene (cumene)	8.62E+00	5.06E-07	1.42E-06
Lead	1.04E+02	6.11E-06	1.71E-05
Napthalene	2.78E+00	1.63E-07	4.56E-07

DERMAL CONTACT				
INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)				
Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	1.30E-01	4.98E-02	1.33E-09	3.72E-09
Aluminum	1.00E-02	6.91E+03	1.42E-05	3.98E-05
Aroclor-1254	1.40E-01	7.40E-01	2.13E-08	5.96E-08
Benzo(a)anthracene	1.30E-01	8.59E-01	2.29E-08	6.42E-08
Benzo(a)pyrene	1.30E-01	1.01E+00	2.69E-08	7.54E-08
Benzo(b)fluoranthene	1.30E-01	1.26E+00	3.36E-08	9.39E-08
Benzo(k)fluoranthene	1.30E-01	3.78E-01	1.01E-08	2.83E-08
Dibenz(a,h)anthracene	1.30E-01	2.36E-01	6.30E-09	1.77E-08
Dieldrin	1.30E-01	2.10E-03	5.61E-11	1.57E-10
Indeno(1,2,3-cd)pyrene	1.30E-01	7.61E-01	2.03E-08	5.69E-08
Iron	1.00E-02	1.75E+04	3.59E-05	1.00E-04
Isopropylbenzene (cumene)	1.30E-01	8.62E+00	2.30E-07	6.45E-07
Lead	1.00E-02	1.04E+02	2.14E-07	5.98E-07
Napthalene	1.30E-01	2.78E+00	7.41E-08	2.08E-07

INHALATION PATHWAY				
Ac =	Sc * (1/PEF)			
EAC =	(Ac * EF * ED) / AT	*for carcinogens, a conversion is necessary to get into proper units, ug/m3		
Chemical	Sc	Ac	EAC for Carcinogens	EAC for Noncarcinogens
4,4-DDD	2.90E-03	2.90E-12	6.81E-11	1.91E-13
Aluminum	5.95E+03	5.95E-06	1.40E-04	3.91E-07
Aroclor-1254	7.26E-01	7.26E-10	1.70E-08	4.77E-11
Benzo(a)anthracene	1.21E+00	1.21E-09	2.84E-08	7.96E-11
Benzo(a)pyrene	1.46E+00	1.46E-09	3.42E-08	9.58E-11
Benzo(b)fluoranthene	1.64E+00	1.64E-09	3.85E-08	1.08E-10
Benzo(k)fluoranthene	6.51E-01	6.51E-10	1.53E-08	4.28E-11
Dibenz(a,h)anthracene	3.63E-01	3.63E-10	6.52E-09	2.39E-11
Dieldrin	3.00E-03	3.00E-12	7.05E-11	1.97E-13
Indeno(1,2,3-cd)pyrene	1.12E+00	1.12E-09	2.62E-08	7.33E-11
Iron	1.78E+04	1.78E-05	4.19E-04	1.17E-06
Isopropylbenzene (cumene)	8.62E+00	8.62E-09	2.02E-07	5.67E-10
Lead	8.45E+01	8.45E-08	1.98E-06	5.56E-09
Napthalene	2.78E+00	2.78E-09	6.52E-08	1.82E-10

**TABLE C-5
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AVERAGE – CONSTRUCTION WORKER**

SOIL INGESTION			
INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)			
Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	165	professional judgment
SA	Skin surface area (cm2)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm2)	0.14	EPA, 2004b
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	90	professional judgment
ED	Exposure duration (yr)	1	professional judgment
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	365	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	7.66E-03	6.36E-11	4.45E-09
Aluminum	6.45E+03	5.36E-05	3.75E-03
Aroclor-1254	2.05E-01	1.70E-09	1.19E-07
Benzo(a)anthracene	2.68E-01	2.23E-09	1.56E-07
Benzo(a)pyrene	3.47E-01	2.88E-09	2.02E-07
Benzo(b)fluoranthene	4.66E-01	3.87E-09	2.71E-07
Benzo(k)fluoranthene	1.57E-01	1.30E-09	9.13E-08
Dibenz(a,h)anthracene	1.13E-01	9.38E-10	6.57E-08
Dieldrin	9.01E-04	7.48E-12	5.24E-10
Indeno(1,2,3-cd)pyrene	3.68E-01	3.06E-09	2.14E-07
Iron	1.43E+04	1.19E-04	8.30E-03
Isopropylbenzene (cumene)	8.31E-01	6.90E-09	4.83E-07
Lead	5.35E+01	4.44E-07	3.11E-05
Napthalene	3.23E-01	2.68E-09	1.88E-07

DERMAL CONTACT			
INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)			

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	1.30E-01	7.66E-03	2.32E-11	1.62E-09
Aluminum	1.00E-02	6.45E+03	1.50E-06	1.05E-04
Aroclor-1254	1.40E-01	2.05E-01	6.67E-10	4.67E-08
Benzo(a)anthracene	1.30E-01	2.68E-01	8.10E-10	5.67E-08
Benzo(a)pyrene	1.30E-01	3.47E-01	1.05E-09	7.34E-08
Benzo(b)fluoranthene	1.30E-01	4.66E-01	1.41E-09	9.86E-08
Benzo(k)fluoranthene	1.30E-01	1.57E-01	4.75E-10	3.32E-08
Dibenz(a,h)anthracene	1.30E-01	1.13E-01	3.42E-10	2.39E-08
Dieldrin	1.30E-01	9.01E-04	2.72E-12	1.91E-10
Indeno(1,2,3-cd)pyrene	1.30E-01	3.68E-01	1.11E-09	7.79E-08
Iron	1.00E-02	1.43E+04	3.32E-06	2.32E-04
Isopropylbenzene (cumene)	1.30E-01	8.31E-01	2.51E-09	1.76E-07
Lead	1.00E-02	5.35E+01	1.24E-08	8.71E-07
Napthalene	1.30E-01	3.23E-01	9.76E-10	6.83E-08

INHALATION PATHWAY			
Ac =	Sc * (1/PEF)		
EAC =	(Ac * EF * ED) / AT	*for carcinogens, a conversion is necessary to get into proper units, ug/m3	

Chemical	Sc	Ac	EAC for Carcinogens	EAC for Noncarcinogens
4,4-DDD	7.89E-04	7.89E-13	2.78E-12	1.95E-13
Aluminum	5.34E+03	5.34E-06	1.88E-05	1.32E-06
Aroclor-1254	1.37E-01	1.37E-10	4.83E-10	3.38E-11
Benzo(a)anthracene	3.45E-01	3.45E-10	1.22E-09	8.51E-11
Benzo(a)pyrene	4.57E-01	4.57E-10	1.61E-09	1.13E-10
Benzo(b)fluoranthene	5.82E-01	5.82E-10	2.05E-09	1.44E-10
Benzo(k)fluoranthene	2.40E-01	2.40E-10	8.46E-10	5.92E-11
Dibenz(a,h)anthracene	1.55E-01	1.55E-10	5.46E-10	3.82E-11
Dieldrin	9.97E-04	9.97E-13	3.51E-12	2.46E-13
Indeno(1,2,3-cd)pyrene	4.70E-01	4.70E-10	1.66E-09	1.16E-10
Iron	1.63E+04	1.63E-05	5.74E-05	4.02E-06
Isopropylbenzene (cumene)	8.31E-01	8.31E-10	2.93E-09	2.05E-10
Lead	6.96E+01	6.96E-08	2.45E-07	1.72E-08
Napthalene	3.23E-01	3.23E-10	1.14E-09	7.96E-11

TABLE C-6
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RME - CONSTRUCTION WORKER

SOIL INGESTION			
INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)			
Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m ³)	see below	
EAC	Effective air concentration (mg/m ³)	calculated	
PEF	Particulate Emission Factor (m ³ /kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	330	EPA, 2001
SA	Skin surface area (cm ²)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm ²)	0.3	EPA, 2004b
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	250	professional judgment
ED	Exposure duration (yr)	1	professional judgment
CF	Conversion factor (kg/mg)	1.00E-08	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	365	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	4.98E-02	2.30E-09	1.61E-07
Aluminum	6.91E+03	3.19E-04	2.23E-02
Aroclor-1254	7.40E-01	3.41E-08	2.39E-06
Benzo(a)anthracene	8.59E-01	3.96E-08	2.77E-06
Benzo(a)pyrene	1.01E+00	4.65E-08	3.25E-06
Benzo(b)fluoranthene	1.26E+00	5.79E-08	4.06E-06
Benzo(k)fluoranthene	3.78E-01	1.74E-08	1.22E-06
Dibenz(a,h)anthracene	2.36E-01	1.09E-08	7.62E-07
Dieldrin	2.10E-03	9.89E-11	6.78E-09
Indeno(1,2,3-cd)pyrene	7.61E-01	3.51E-08	2.46E-06
Iron	1.75E+04	8.05E-04	5.64E-02
Isopropylbenzene (cumene)	8.62E+00	3.98E-07	2.78E-05
Lead	1.04E+02	4.80E-06	3.36E-04
Napthalene	2.78E+00	1.28E-07	8.96E-06

DERMAL CONTACT				
INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)				
Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	1.30E-01	4.98E-02	8.96E-10	6.27E-08
Aluminum	1.00E-02	6.91E+03	9.57E-06	6.70E-04
Aroclor-1254	1.40E-01	7.40E-01	1.43E-08	1.00E-06
Benzo(a)anthracene	1.30E-01	8.59E-01	1.55E-08	1.08E-06
Benzo(a)pyrene	1.30E-01	1.01E+00	1.81E-08	1.27E-06
Benzo(b)fluoranthene	1.30E-01	1.26E+00	2.26E-08	1.58E-06
Benzo(k)fluoranthene	1.30E-01	3.78E-01	6.80E-09	4.76E-07
Dibenz(a,h)anthracene	1.30E-01	2.36E-01	4.25E-09	2.97E-07
Dieldrin	1.30E-01	2.10E-03	3.78E-11	2.64E-09
Indeno(1,2,3-cd)pyrene	1.30E-01	7.61E-01	1.37E-08	9.58E-07
Iron	1.00E-02	1.75E+04	2.42E-05	1.69E-03
Isopropylbenzene (cumene)	1.30E-01	8.62E+00	1.55E-07	1.09E-05
Lead	1.00E-02	1.04E+02	1.44E-07	1.01E-05
Napthalene	1.30E-01	2.78E+00	4.98E-08	3.49E-06

INHALATION PATHWAY				
Ac =	Sc * (1/PEF)			
EAC =	(Ac * EF * ED) / AT	*for carcinogens, a conversion is necessary to get into proper units, ug/m3		
Chemical	Sc	Ac	EAC for Carcinogens	EAC for Noncarcinogens
4,4-DDD	2.90E-03	2.90E-12	2.84E-11	1.99E-12
Aluminum	5.95E+03	5.95E-06	5.82E-05	4.07E-06
Aroclor-1254	7.26E-01	7.26E-10	7.10E-09	4.97E-10
Benzo(a)anthracene	1.21E+00	1.21E-09	1.18E-08	8.29E-10
Benzo(a)pyrene	1.46E+00	1.46E-09	1.43E-08	9.98E-10
Benzo(b)fluoranthene	1.64E+00	1.64E-09	1.60E-08	1.12E-09
Benzo(k)fluoranthene	6.51E-01	6.51E-10	6.37E-09	4.46E-10
Dibenz(a,h)anthracene	3.63E-01	3.63E-10	3.55E-09	2.49E-10
Dieldrin	3.00E-03	3.00E-12	2.94E-11	2.05E-12
Indeno(1,2,3-cd)pyrene	1.12E+00	1.12E-09	1.09E-08	7.64E-10
Iron	1.78E+04	1.78E-05	1.75E-04	1.22E-05
Isopropylbenzene (cumene)	8.62E+00	8.62E-09	8.43E-08	5.90E-09
Lead	8.45E+01	8.45E-08	8.27E-07	5.79E-08
Napthalene	2.78E+00	2.78E-09	2.72E-08	1.90E-09

TABLE C-7
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
AVERAGE – INDUSTRIAL WORKER

SOIL INGESTION				
INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)				
Parameter	Definition	Value	Reference	
Intake	Intake of chemical (mg/kg-day)	calculated		
Sc	Soil concentration (mg/kg)	see data page		
Ac	Air concentration (mg/m ³)	see below		
EAC	Effective air concentration (mg/m ³)	calculated		
PEF	Particulate Emission Factor (m ³ /kg)	1.00E+09	EPA, 2004a	
IR	Ingestion rate of soil (mg/day)	50	EPA, 2004a	
SA	Skin surface area (cm ²)	3300	EPA, 2004a	
AF	Soil to skin adherence factor (mg/cm ²)	0.021	EPA, 2004a	
ABSd	Dermal absorption fraction (unitless)	see chemprop page		
EF	Exposure frequency (day/yr)	250	EPA, 2004a	
ED	Exposure duration (yr)	25	EPA, 2004a	
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989	
BW	Body weight (kg)	70	EPA, 1989	
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989	
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989	

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	7.66E-03	1.34E-09	3.75E-09
Aluminum	6.45E+03	1.13E-03	3.16E-03
Aroclor-1254	2.06E-01	3.58E-08	1.00E-07
Benzo(a)anthracene	2.68E-01	4.68E-08	1.31E-07
Benzo(a)pyrene	3.47E-01	6.06E-08	1.70E-07
Benzo(b)fluoranthene	4.66E-01	8.14E-08	2.28E-07
Benzo(k)fluoranthene	1.57E-01	2.74E-08	7.68E-08
Dibenz(a,h)anthracene	1.13E-01	1.97E-08	5.53E-08
Dieldrin	9.01E-04	1.57E-10	4.41E-10
Indeno(1,2,3-cd)pyrene	3.68E-01	6.43E-08	1.80E-07
Iron	1.43E+04	2.49E-03	6.98E-03
Isopropylbenzene (cumene)	8.31E-01	1.45E-07	4.07E-07
Lead	5.35E+01	9.35E-06	2.62E-05
Napthalene	3.23E-01	5.64E-08	1.58E-07

DERMAL CONTACT				
INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)				
Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	1.30E-01	7.66E-03	2.41E-10	6.75E-10
Aluminum	1.00E-02	6.45E+03	1.56E-05	4.37E-05
Aroclor-1254	1.40E-01	2.06E-01	6.95E-09	1.95E-08
Benzo(a)anthracene	1.30E-01	2.68E-01	8.44E-09	2.36E-08
Benzo(a)pyrene	1.30E-01	3.47E-01	1.09E-08	3.06E-08
Benzo(b)fluoranthene	1.30E-01	4.66E-01	1.47E-08	4.11E-08
Benzo(k)fluoranthene	1.30E-01	1.57E-01	4.94E-09	1.38E-08
Dibenz(a,h)anthracene	1.30E-01	1.13E-01	3.56E-09	9.96E-09
Dieldrin	1.30E-01	9.01E-04	2.84E-11	7.94E-11
Indeno(1,2,3-cd)pyrene	1.30E-01	3.68E-01	1.16E-08	3.24E-08
Iron	1.00E-02	1.43E+04	3.46E-05	9.68E-05
Isopropylbenzene (cumene)	1.30E-01	8.31E-01	2.62E-08	7.33E-08
Lead	1.00E-02	5.35E+01	1.30E-07	3.63E-07
Napthalene	1.30E-01	3.23E-01	1.02E-08	2.85E-08

INHALATION PATHWAY				
Ac =	Sc * (1/PEF)			
EAC =	(Ac * EF * ED) / AT *for carcinogens, a conversion is necessary to get into proper units, ug/m3			
Chemical	Sc	Ac	EAC for Carcinogens	EAC for Noncarcinogens
4,4-DDD	7.89E-04	7.89E-13	1.93E-10	5.41E-13
Aluminum	5.34E+03	5.34E-06	1.31E-03	3.65E-06
Aroclor-1254	1.37E-01	1.37E-10	3.35E-08	9.38E-11
Benzo(a)anthracene	3.45E-01	3.45E-10	8.44E-08	2.36E-10
Benzo(a)pyrene	4.57E-01	4.57E-10	1.12E-07	3.13E-10
Benzo(b)fluoranthene	5.82E-01	5.82E-10	1.42E-07	3.99E-10
Benzo(k)fluoranthene	2.40E-01	2.40E-10	5.87E-08	1.64E-10
Dibenz(a,h)anthracene	1.55E-01	1.55E-10	3.79E-08	1.06E-10
Dieldrin	9.97E-04	9.97E-13	2.44E-10	6.63E-13
Indeno(1,2,3-cd)pyrene	4.70E-01	4.70E-10	1.15E-07	3.22E-10
Iron	1.63E+04	1.63E-05	3.98E-03	1.12E-05
Isopropylbenzene (cumene)	8.31E-01	8.31E-10	2.03E-07	5.69E-10
Lead	6.96E+01	6.96E-08	1.70E-05	4.77E-08
Napthalene	3.23E-01	3.23E-10	7.90E-08	2.21E-10

TABLE C-8
INTAKE CALCULATIONS FOR SOIL SOUTH OF MARLIN
RME – INDUSTRIAL WORKER

SOIL INGESTION			
INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)			
Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	50	EPA, 2004a
SA	Skin surface area (cm2)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm2)	0.2	EPA, 2004a
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	250	EPA, 2004a
ED	Exposure duration (yr)	25	EPA, 2004a
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	4.98E-02	8.70E-09	2.44E-08
Aluminum	6.91E+03	1.21E-03	3.38E-03
Aroclor-1254	7.40E-01	1.29E-07	3.62E-07
Benzo(a)anthracene	8.59E-01	1.50E-07	4.20E-07
Benzo(a)pyrene	1.01E+00	1.76E-07	4.93E-07
Benzo(b)fluoranthene	1.26E+00	2.19E-07	6.14E-07
Benzo(k)fluoranthene	3.78E-01	6.60E-08	1.85E-07
Dibenz(a,h)anthracene	2.36E-01	4.12E-08	1.15E-07
Dieldrin	2.10E-03	3.67E-10	1.03E-09
Indeno(1,2,3-cd)pyrene	7.61E-01	1.33E-07	3.72E-07
Iron	1.75E+04	3.05E-03	8.54E-03
Isopropylbenzene (cumene)	8.62E+00	1.51E-06	4.22E-06
Lead	1.04E+02	1.82E-05	5.09E-05
Napthalene	2.78E+00	4.85E-07	1.36E-06

DERMAL CONTACT				
INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)				

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
4,4-DDD	1.30E-01	4.98E-02	1.49E-08	4.18E-08
Aluminum	1.00E-02	6.91E+03	1.59E-04	4.47E-04
Aroclor-1254	1.40E-01	7.40E-01	2.39E-07	6.69E-07
Benzo(a)anthracene	1.30E-01	8.59E-01	2.58E-07	7.21E-07
Benzo(a)pyrene	1.30E-01	1.01E+00	3.02E-07	8.46E-07
Benzo(b)fluoranthene	1.30E-01	1.26E+00	3.77E-07	1.05E-06
Benzo(k)fluoranthene	1.30E-01	3.78E-01	1.13E-07	3.17E-07
Dibenz(a,h)anthracene	1.30E-01	2.36E-01	7.08E-08	1.98E-07
Dieldrin	1.30E-01	2.10E-03	6.30E-10	1.76E-09
Indeno(1,2,3-cd)pyrene	1.30E-01	7.61E-01	2.28E-07	6.39E-07
Iron	1.00E-02	1.75E+04	4.03E-04	1.13E-03
Isopropylbenzene (cumene)	1.30E-01	8.62E+00	2.58E-06	7.24E-06
Lead	1.00E-02	1.04E+02	2.40E-06	6.72E-06
Napthalene	1.30E-01	2.78E+00	8.32E-07	2.33E-06

INHALATION PATHWAY				
Ac =	Sc * (1/PEF)			
EAC =	(Ac * EF * ED) / AT	*for carcinogens, a conversion is necessary to get into proper units, ug/m3		

Chemical	Sc	Ac	EAC for Carcinogens	EAC for Noncarcinogens
4,4-DDD	2.90E-03	2.90E-12	7.09E-10	1.99E-12
Aluminum	5.95E+03	5.95E-06	1.45E-03	4.07E-06
Aroclor-1254	7.26E-01	7.28E-10	1.78E-07	4.97E-10
Benzo(a)anthracene	1.21E+00	1.21E-09	2.96E-07	8.29E-10
Benzo(a)pyrene	1.46E+00	1.46E-09	3.56E-07	9.98E-10
Benzo(b)fluoranthene	1.64E+00	1.64E-09	4.01E-07	1.12E-09
Benzo(k)fluoranthene	6.51E-01	6.51E-10	1.59E-07	4.46E-10
Dibenz(a,h)anthracene	3.63E-01	3.63E-10	8.88E-08	2.49E-10
Dieldrin	3.00E-03	3.00E-12	7.34E-10	2.05E-12
Indeno(1,2,3-cd)pyrene	1.12E+00	1.12E-09	2.73E-07	7.64E-10
Iron	1.78E+04	1.78E-05	4.37E-03	1.22E-05
Isopropylbenzene (cumene)	8.62E+00	8.62E-09	2.11E-06	5.90E-09
Lead	8.45E+01	8.45E-08	2.07E-05	5.79E-08
Napthalene	2.78E+00	2.78E-09	6.79E-07	1.90E-09

TABLE C-9
EXPOSURE POINT CONCENTRATION (mg/kg) FOR COPCs
SOIL NORTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
1,2-Dichloroethane	0.0106		0.103	99% Chebyshev
Aluminum	11971		13092	95% Student's-t
Aroclor-1254	0.0056		0.0168	95% Chebyshev
Benzo(a)anthracene	0.068		0.464	99% Chebyshev
Benzo(a)pyrene	0.0922		0.554	99% Chebyshev
Benzo(b)fluoranthene	0.12		0.649	99% Chebyshev
Dibenz(a,h)anthracene	0.0384		0.177	99% Chebyshev
Indeno(1,2,3-cd)pyrene	0.133		0.577	99% Chebyshev
Iron	17531		21765	95% Student's-t
Tetrachloroethene	0.0127		0.129	99% Chebyshev

TABLE C-10
EXPOSURE POINT CONCENTRATION (mg/kg) FOR COPCs
SURFACE SOIL NORTH OF MARLIN AVE.

Parameter	Average		95% UCL	Statistic Used
1,2-Dichloroethane				
Aluminum	10673		12185	95% Student's-t
Aroclor-1254	0.0037		0.0077	95% Chebyshev
Benzo(a)anthracene	0.0715		0.72	99% Chebyshev
Benzo(a)pyrene	0.114		0.888	99% Chebyshev
Benzo(b)fluoranthene	0.146		0.352	95% Adjusted Gamma
Dibenz(a,h)anthracene	0.0471		0.284	99% Chebyshev
Indeno(1,2,3-cd)pyrene	0.151		0.969	99% Chebyshev
Iron	19477		41127	95% Chebyshev
Tetrachloroethene	0		0	NS

Notes:

NS -- Not Sampled in surface soil.

TABLE C-11
CALCULATION OF OUTDOOR AIR CONCENTRATION FROM EXPOSED SOIL - VOLATILE EMISSIONS

$De = \frac{H' \cdot Da \cdot na^{3.33}/n^2 + Dw \cdot nw^{3.33}/n^2}{Pb \cdot Kd + nw + na \cdot H'}$		$Kd = Foc \cdot Koc$							
$VF = \frac{(3.14 \cdot De \cdot T)^{0.5} \cdot Q/C}{(2 \cdot Pb \cdot De) \cdot CF}$		$na = n - nw$							
Source: EPA, 1996									
Parameter	Definition	Value	Reference						
Da	Diffusion coefficient in air (cm^2/sec)	see below	EPA, 1996						
Dw	Diffusion coefficient in water (cm^2/sec)	see below	EPA, 1996						
De	Effective diffusion coefficient (cm^2/sec)	see below	calculated						
VF	Volatilization Factor (m3/kg)	see below	calculated						
n	Total porosity (dimensionless)	0.35	TNRCC, 1993						
nw	Water filled soil porosity (dimensionless)	0.15	EPA, 1996						
na	Air filled soil porosity (dimensionless)	0.2	n-nw						
H'	Henry's law constant (dimensionless)	see below	TRRP						
Pb	Dry Bulk Density (g/cm^3)	1.5	EPA, 1996						
Foc	Fraction organic carbon (g/g)	0.006	EPA, 1996						
Koc	Organic carbon-water partition coefficient (cm^3/g)	see below	EPA, 1996						
Kd	Soil-water partition coefficient (cm^3/g)	see below	calculated						
CF	Conversion factor (cm^2/m^2)	1.00E+04	standard						
Q/C	Inverse of the mean conc. at center of source (g/m^2-s per kg/m^3)	see below	EPA, 1996						
T	Exposure interval (sec)	see below	EPA, 1996						
Chemical	Da	Dw	De	H'	Koc	Kd	Q/C	T	VF
1,2,3-Trichloropropane	7.10E-02	7.90E-06	7.86E-05	1.58E-02	4.37E+01	0.2622	68.81	9.50E+08	1.41E+04
Tetrachloroethene	7.20E-02	8.20E-06	6.84E-03	7.65E+00	1.55E+02	0.93	68.81	9.50E+08	1.51E+03
Trichloroethene	7.90E-02	9.10E-06	7.47E-04	4.28E-01	1.66E+02	1.00	68.81	9.50E+08	4.58E+03

TABLE C-12
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
AVERAGE – YOUTH TRESPASSER

SOIL INGESTION

INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
VF	Volatilization Factor (m^3/kg)	calculated	EPA, 1996
IR	Ingestion rate of soil (mg/day)	100	TNRCC, 1998
SA	Skin surface area (cm2)	3500	TNRCC, 1998
AF	Soil to skin adherence factor (mg/cm2)	0.1	TNRCC, 1998
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	25	professional judgment
ED	Exposure duration (yr)	6	professional judgment
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	40	EPA, 1991a
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.06E-02	1.56E-10	4.36E-10
Aluminum	1.20E+04	1.76E-04	4.92E-04
Aroclor-1254	5.60E-03	8.22E-11	2.30E-10
Benzo(a)anthracene	6.80E-02	9.98E-10	2.79E-09
Benzo(a)pyrene	9.22E-02	1.35E-09	3.79E-09
Benzo(b)fluoranthene	1.20E-01	1.76E-09	4.93E-09
Dibenz(a,h)anthracene	3.84E-02	5.84E-10	1.58E-09
Indeno(1,2,3-cd)pyrene	1.33E-01	1.95E-09	5.47E-09
Iron	1.75E+04	2.57E-04	7.20E-04
Tetrachloroethene	1.27E-02	1.86E-10	5.22E-10

DERMAL CONTACT

INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.30E-01	1.06E-02	7.08E-11	1.98E-10
Aluminum	1.00E-02	1.20E+04	6.15E-06	1.72E-05
Aroclor-1254	1.30E-01	5.60E-03	3.74E-11	1.05E-10
Benzo(a)anthracene	1.30E-01	6.80E-02	4.54E-10	1.27E-09
Benzo(a)pyrene	1.30E-01	9.22E-02	6.16E-10	1.72E-09
Benzo(b)fluoranthene	1.30E-01	1.20E-01	8.01E-10	2.24E-09
Dibenz(a,h)anthracene	1.30E-01	3.84E-02	2.56E-10	7.18E-10
Indeno(1,2,3-cd)pyrene	1.30E-01	1.33E-01	8.88E-10	2.49E-09
Iron	1.00E-02	1.75E+04	9.01E-06	2.52E-05
Tetrachloroethene	1.30E-01	1.27E-02	8.48E-11	2.37E-10

INHALATION PATHWAY

Ac = Sc * (1/PEF+1/VF)

EAC = (Ac * EF * ED) / AT

*for carcinogens, a conversion is necessary to get into proper units, ug/m3

Chemical	Sc	VF	Ac	EAC for Carcinogens	EAC for Noncarcinogens
1,2-Dichloroethane	1.06E-02	1.41E+04	7.50E-07	4.40E-06	1.23E-08
Aluminum	1.07E+04		1.07E-05	6.27E-05	1.75E-07
Aroclor-1254	3.70E-03		3.70E-12	2.17E-11	6.08E-14
Benzo(a)anthracene	7.15E-02		7.15E-11	4.20E-10	1.18E-12
Benzo(a)pyrene	1.14E-01		1.14E-10	6.69E-10	1.87E-12
Benzo(b)fluoranthene	1.46E-01		1.46E-10	8.57E-10	2.40E-12
Dibenz(a,h)anthracene	4.71E-02		4.71E-11	2.77E-10	7.74E-13
Indeno(1,2,3-cd)pyrene	1.51E-01		1.51E-10	8.86E-10	2.48E-12
Iron	1.95E+04		1.95E-05	1.14E-04	3.20E-07
Tetrachloroethene	1.27E-02	1.51E+03	8.38E-06	4.92E-05	1.38E-07

TABLE C-13
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RME -- YOUTH TRESPASSER (age 6 to 18)

SOIL INGESTION

INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
VF	Volatilization Factor (m^3/kg)	calculated	EPA, 1996
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	100	TNRCC, 1998
SA	Skin surface area (cm2)	3500	TNRCC, 1998
AF	Soil to skin adherence factor (mg/cm2)	0.1	TNRCC, 1998
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	50	TNRCC, 1998
ED	Exposure duration (yr)	12	TNRCC, 1998
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	40	EPA, 1991a
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.03E-01	6.05E-09	1.69E-08
Aluminum	1.31E+04	7.69E-04	2.15E-03
Aroclor-1254	1.68E-02	9.86E-10	2.76E-09
Benzo(a)anthracene	4.64E-01	2.72E-08	7.63E-08
Benzo(a)pyrene	5.54E-01	3.25E-08	9.11E-08
Benzo(b)fluoranthene	6.49E-01	3.81E-08	1.07E-07
Dibenz(a,h)anthracene	1.77E-01	1.04E-08	2.91E-08
Indeno(1,2,3-cd)pyrene	5.77E-01	3.39E-08	9.48E-08
Iron	2.18E+04	1.28E-03	3.58E-03
Tetrachloroethene	1.29E-01	7.57E-09	2.12E-08

DERMAL CONTACT

INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.30E-01	1.03E-01	2.75E-09	7.70E-09
Aluminum	1.00E-02	1.31E+04	2.69E-05	7.53E-05
Aroclor-1254	1.30E-01	1.68E-02	4.49E-10	1.26E-09
Benzo(a)anthracene	1.30E-01	4.64E-01	1.24E-08	3.47E-08
Benzo(a)pyrene	1.30E-01	5.54E-01	1.48E-08	4.14E-08
Benzo(b)fluoranthene	1.30E-01	6.49E-01	1.73E-08	4.85E-08
Dibenz(a,h)anthracene	1.30E-01	1.77E-01	4.73E-09	1.32E-08
Indeno(1,2,3-cd)pyrene	1.30E-01	5.77E-01	1.54E-08	4.32E-08
Iron	1.00E-02	2.18E+04	4.47E-05	1.25E-04
Tetrachloroethene	1.30E-01	1.29E-01	3.45E-09	9.65E-09

INHALATION PATHWAY

Ac = Sc * (1/PEF+1/VF)

EAC = (Ac * EF * ED) / AT

*for carcinogens, a conversion is necessary to get into proper units, ug/m3

Chemical	Sc	VF	Ac	EAC for Carcinogens	EAC for Noncarcinogens
1,2-Dichloroethane	1.03E-01	1.41E+04	7.29E-06	1.71E-04	4.79E-07
Aluminum	1.22E+04		1.22E-05	2.86E-04	8.01E-07
Aroclor-1254	7.70E-03		7.70E-12	1.81E-10	5.06E-13
Benzo(a)anthracene	7.20E-01		7.20E-10	1.69E-08	4.73E-11
Benzo(a)pyrene	8.88E-01		8.88E-10	2.09E-08	5.84E-11
Benzo(b)fluoranthene	3.52E-01		3.52E-10	8.27E-09	2.31E-11
Dibenz(a,h)anthracene	2.84E-01		2.84E-10	6.67E-09	1.87E-11
Indeno(1,2,3-cd)pyrene	9.69E-01		9.69E-10	2.28E-08	6.37E-11
Iron	4.11E+04		4.11E-05	9.66E-04	2.70E-06
Tetrachloroethene	1.29E-01	1.51E+03	8.52E-05	2.00E-03	5.60E-06

TABLE C-14
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
AVERAGE - CONSTRUCTION WORKER

SOIL INGESTION

$$\text{INTAKE} = (\text{Sc} * \text{IR} * \text{EF} * \text{ED} * \text{CF}) / (\text{BW} * \text{AT})$$

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
VF	Volatilization Factor (m^3/kg)	calculated	EPA, 1996
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	165	professional judgment
SA	Skin surface area (cm2)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm2)	0.14	EPA, 2004b
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	90	professional judgment
ED	Exposure duration (yr)	1	professional judgment
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	365	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.06E-02	8.80E-11	6.16E-09
Aluminum	1.20E+04	9.94E-05	6.96E-03
Aroclor-1254	5.60E-03	4.65E-11	3.25E-09
Benzo(a)anthracene	6.80E-02	5.65E-10	3.95E-08
Benzo(a)pyrene	9.22E-02	7.66E-10	5.36E-08
Benzo(b)fluoranthene	1.20E-01	9.96E-10	6.97E-08
Dibenz(a,h)anthracene	3.84E-02	3.19E-10	2.23E-08
Indeno(1,2,3-cd)pyrene	1.33E-01	1.10E-09	7.73E-08
Iron	1.75E+04	1.46E-04	1.02E-02
Tetrachloroethene	1.27E-02	1.05E-10	7.38E-09

DERMAL CONTACT

$$\text{INTAKE} = (\text{Sc} * \text{SA} * \text{AF} * \text{ABSd} * \text{EF} * \text{ED} * \text{CF}) / (\text{BW} * \text{AT})$$

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.30E-01	1.06E-02	3.20E-11	2.24E-09
Aluminum	1.00E-02	1.20E+04	2.78E-06	1.95E-04
Aroclor-1254	1.30E-01	5.60E-03	1.69E-11	1.18E-09
Benzo(a)anthracene	1.30E-01	6.80E-02	2.06E-10	1.44E-08
Benzo(a)pyrene	1.30E-01	9.22E-02	2.79E-10	1.95E-08
Benzo(b)fluoranthene	1.30E-01	1.20E-01	3.63E-10	2.54E-08
Dibenz(a,h)anthracene	1.30E-01	3.84E-02	1.16E-10	8.12E-09
Indeno(1,2,3-cd)pyrene	1.30E-01	1.33E-01	4.02E-10	2.81E-08
Iron	1.00E-02	1.75E+04	4.08E-06	2.85E-04
Tetrachloroethene	1.30E-01	1.27E-02	3.84E-11	2.69E-09

INHALATION PATHWAY

Ac = Sc * (1/PEF + 1/VF)

EAC = (Ac * EF * ED) / AT

*for carcinogens, a conversion is necessary to get into proper units, ug/m3

Chemical	Sc	VF	Ac	EAC for Carcinogens	EAC for Noncarcinogens
1,2-Dichloroethane	1.06E-02	1.41E+04	7.50E-07	2.64E-06	1.85E-07
Aluminum	1.07E+04		1.07E-05	3.76E-05	2.63E-06
Aroclor-1254	3.70E-03		3.70E-12	1.30E-11	9.12E-13
Benzo(a)anthracene	7.15E-02		7.15E-11	2.52E-10	1.76E-11
Benzo(a)pyrene	1.14E-01		1.14E-10	4.02E-10	2.81E-11
Benzo(b)fluoranthene	1.46E-01		1.46E-10	5.14E-10	3.60E-11
Dibenz(a,h)anthracene	4.71E-02		4.71E-11	1.66E-10	1.16E-11
Indeno(1,2,3-cd)pyrene	1.51E-01		1.51E-10	5.32E-10	3.72E-11
Iron	1.95E+04		1.95E-05	6.86E-05	4.80E-06
Tetrachloroethene	1.27E-02	1.51E+03	8.38E-06	2.95E-05	2.07E-06

TABLE C-15
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RME -- CONSTRUCTION WORKER

SOIL INGESTION

$$\text{INTAKE} = (\text{Sc} * \text{IR} * \text{EF} * \text{ED} * \text{CF}) / (\text{BW} * \text{AT})$$

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
VF	Volatilization Factor (m^3/kg)	calculated	EPA, 1996
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	330	EPA, 2001
SA	Skin surface area (cm2)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm2)	0.3	EPA, 2001b
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	250	professional judgment
ED	Exposure duration (yr)	1	professional judgment
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	365	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.03E-01	4.75E-09	3.33E-07
Aluminum	1.31E+04	6.04E-04	4.23E-02
Aroclor-1254	1.68E-02	7.75E-10	5.42E-08
Benzo(a)anthracene	4.64E-01	2.14E-08	1.50E-06
Benzo(a)pyrene	5.54E-01	2.56E-08	1.79E-06
Benzo(b)fluoranthene	6.49E-01	2.99E-08	2.10E-06
Dibenz(a,h)anthracene	1.77E-01	8.16E-09	5.72E-07
Indeno(1,2,3-cd)pyrene	5.77E-01	2.66E-08	1.86E-06
Iron	2.18E+04	1.00E-03	7.03E-02
Tetrachloroethene	1.29E-01	5.95E-09	4.17E-07

DERMAL CONTACT

$$\text{INTAKE} = (\text{Sc} * \text{SA} * \text{AF} * \text{ABSd} * \text{EF} * \text{ED} * \text{CF}) / (\text{BW} * \text{AT})$$

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.30E-01	1.03E-01	1.85E-09	1.30E-07
Aluminum	1.00E-02	1.31E+04	1.81E-05	1.27E-03
Aroclor-1254	1.30E-01	1.68E-02	3.02E-10	2.12E-08
Benzo(a)anthracene	1.30E-01	4.64E-01	8.35E-09	5.84E-07
Benzo(a)pyrene	1.30E-01	5.54E-01	9.97E-09	6.98E-07
Benzo(b)fluoranthene	1.30E-01	6.49E-01	1.17E-08	8.17E-07
Dibenz(a,h)anthracene	1.30E-01	1.77E-01	3.18E-09	2.23E-07
Indeno(1,2,3-cd)pyrene	1.30E-01	5.77E-01	1.04E-08	7.27E-07
Iron	1.00E-02	2.18E+04	3.01E-05	2.11E-03
Tetrachloroethene	1.30E-01	1.29E-01	2.32E-09	1.62E-07

INHALATION PATHWAY

Ac =	Sc * (1/PEF + 1/VF)				
EAC =	(Ac * EF * ED) / AT				
*for carcinogens, a conversion is necessary to get into proper units, ug/m3					

Chemical	Sc	VF	Ac	EAC for Carcinogens	EAC for Noncarcinogens
1,2-Dichloroethane	1.03E-01	1.41E+04	7.29E-06	7.13E-05	4.99E-06
Aluminum	1.22E+04		1.22E-05	1.19E-04	8.35E-06
Aroclor-1254	7.70E-03		7.70E-12	7.53E-11	5.27E-12
Benzo(a)anthracene	7.20E-01		7.20E-10	7.05E-09	4.93E-10
Benzo(a)pyrene	8.88E-01		8.88E-10	8.69E-09	6.08E-10
Benzo(b)fluoranthene	3.52E-01		3.52E-10	3.44E-09	2.41E-10
Dibenz(a,h)anthracene	2.84E-01		2.84E-10	2.78E-09	1.95E-10
Indeno(1,2,3-cd)pyrene	9.69E-01		9.69E-10	9.48E-09	6.64E-10
Iron	4.11E+04		4.11E-05	4.02E-04	2.82E-05
Tetrachloroethene	1.29E-01	1.51E+03	8.52E-05	8.33E-04	5.83E-05

TABLE C-16
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
AVERAGE -- INDUSTRIAL WORKER

SOIL INGESTION

$$\text{INTAKE} = (\text{Sc} * \text{IR} * \text{EF} * \text{ED} * \text{CF}) / (\text{BW} * \text{AT})$$

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
VF	Volatilization Factor (m^3/kg)	calculated	EPA, 1996
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	50	EPA, 2004a
SA	Skin surface area (cm2)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm2)	0.021	EPA, 2001a
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	250	EPA, 2004a
ED	Exposure duration (yr)	25	EPA, 2004a
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.06E-02	1.85E-09	5.19E-09
Aluminum	1.20E+04	2.09E-03	5.86E-03
Aroclor-1254	5.60E-03	9.78E-10	2.74E-09
Benzo(a)anthracene	6.80E-02	1.19E-08	3.33E-08
Benzo(a)pyrene	9.22E-02	1.81E-08	4.51E-08
Benzo(b)fluoranthene	1.20E-01	2.10E-08	5.87E-08
Dibenz(a,h)anthracene	3.84E-02	6.71E-09	1.88E-08
Indeno(1,2,3-cd)pyrene	1.33E-01	2.32E-08	6.51E-08
Iron	1.75E+04	3.06E-03	8.58E-03
Tetrachloroethene	1.27E-02	2.22E-09	6.21E-09

DERMAL CONTACT

$$\text{INTAKE} = (\text{Sc} * \text{SA} * \text{AF} * \text{ABSd} * \text{EF} * \text{ED} * \text{CF}) / (\text{BW} * \text{AT})$$

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.30E-01	1.06E-02	3.34E-10	9.34E-10
Aluminum	1.00E-02	1.20E+04	2.90E-05	8.12E-05
Aroclor-1254	1.30E-01	5.60E-03	1.76E-10	4.94E-10
Benzo(a)anthracene	1.30E-01	6.80E-02	2.14E-09	5.99E-09
Benzo(a)pyrene	1.30E-01	9.22E-02	2.90E-09	8.13E-09
Benzo(b)fluoranthene	1.30E-01	1.20E-01	3.78E-09	1.06E-08
Dibenz(a,h)anthracene	1.30E-01	3.84E-02	1.21E-09	3.38E-09
Indeno(1,2,3-cd)pyrene	1.30E-01	1.33E-01	4.19E-09	1.17E-08
Iron	1.00E-02	1.75E+04	4.25E-05	1.19E-04
Tetrachloroethene	1.30E-01	1.27E-02	4.00E-10	1.12E-09

INHALATION PATHWAY

Ac = Sc * (1/PEF + 1/VF)

EAC = (Ac * EF * ED) / AT

*for carcinogens, a conversion is necessary to get into proper units, ug/m3

Chemical	Sc	VF	Ac	EAC for Carcinogens	EAC for Noncarcinogens
1,2-Dichloroethane	1.06E-02	1.41E+04	7.50E-07	1.84E-04	5.14E-07
Aluminum	1.07E+04		1.07E-05	2.81E-03	7.31E-06
Aroclor-1254	3.70E-03		3.70E-12	9.05E-10	2.53E-12
Benzo(a)anthracene	7.15E-02		7.15E-11	1.75E-08	4.90E-11
Benzo(a)pyrene	1.14E-01		1.14E-10	2.79E-08	7.81E-11
Benzo(b)fluoranthene	1.46E-01		1.46E-10	3.57E-08	1.00E-10
Dibenz(a,h)anthracene	4.71E-02		4.71E-11	1.15E-08	3.23E-11
Indeno(1,2,3-cd)pyrene	1.51E-01		1.51E-10	3.69E-08	1.03E-10
Iron	1.95E+04		1.95E-05	4.76E-03	1.33E-05
Tetrachloroethene	1.27E-02	1.51E+03	8.38E-06	2.05E-03	5.74E-06

TABLE C-17
INTAKE CALCULATIONS FOR SOIL NORTH OF MARLIN
RME -- INDUSTRIAL WORKER

SOIL INGESTION

INTAKE = (Sc * IR * EF * ED * CF) / (BW * AT)

Parameter	Definition	Value	Reference
Intake	Intake of chemical (mg/kg-day)	calculated	
Sc	Soil concentration (mg/kg)	see data page	
Ac	Air concentration (mg/m^3)	see below	
EAC	Effective air concentration (mg/m^3)	calculated	
VF	Volatilization Factor (m^3/kg)	calculated	EPA, 1996
PEF	Particulate Emission Factor (m^3/kg)	1.00E+09	EPA, 2004a
IR	Ingestion rate of soil (mg/day)	50	EPA, 2004a
SA	Skin surface area (cm2)	3300	EPA, 2004a
AF	Soil to skin adherence factor (mg/cm2)	0.2	EPA, 2004a
ABSd	Dermal absorption fraction (unitless)	see chemprop page	
EF	Exposure frequency (day/yr)	250	EPA, 2004a
ED	Exposure duration (yr)	25	EPA, 2004a
CF	Conversion factor (kg/mg)	1.00E-06	EPA, 1989
BW	Body weight (kg)	70	EPA, 1989
ATc	Averaging time for carcinogens (days)	25550	EPA, 1989
ATnc	Averaging time for noncarcinogens (days)	9125	EPA, 1989

Chemical	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.03E-01	1.80E-08	5.04E-08
Aluminum	1.31E+04	2.29E-03	6.41E-03
Aroclor-1254	1.68E-02	2.94E-09	8.22E-09
Benzo(a)anthracene	4.64E-01	8.11E-08	2.27E-07
Benzo(a)pyrene	5.54E-01	9.68E-08	2.71E-07
Benzo(b)fluoranthene	6.49E-01	1.13E-07	3.18E-07
Dibenz(a,h)anthracene	1.77E-01	3.09E-08	8.66E-08
Indeno(1,2,3-cd)pyrene	5.77E-01	1.01E-07	2.82E-07
Iron	2.18E+04	3.80E-03	1.06E-02
Tetrachloroethene	1.29E-01	2.25E-08	6.31E-08

DERMAL CONTACT

INTAKE = (Sc * SA * AF * ABSd * EF * ED * CF) / (BW * AT)

Chemical	ABSd	Sc	Intake for Carcinogens	Intake for Noncarcinogens
1,2-Dichloroethane	1.30E-01	1.03E-01	3.09E-08	8.65E-08
Aluminum	1.00E-02	1.31E+04	3.02E-04	8.45E-04
Aroclor-1254	1.30E-01	1.68E-02	5.04E-09	1.41E-08
Benzo(a)anthracene	1.30E-01	4.64E-01	1.39E-07	3.90E-07
Benzo(a)pyrene	1.30E-01	5.54E-01	1.66E-07	4.65E-07
Benzo(b)fluoranthene	1.30E-01	6.49E-01	1.95E-07	5.45E-07
Dibenz(a,h)anthracene	1.30E-01	1.77E-01	5.31E-08	1.49E-07
Indeno(1,2,3-cd)pyrene	1.30E-01	5.77E-01	1.73E-07	4.84E-07
Iron	1.00E-02	2.18E+04	5.02E-04	1.41E-03
Tetrachloroethene	1.30E-01	1.29E-01	3.87E-08	1.08E-07

INHALATION PATHWAY

Ac = Sc * (1/PEF + 1/VF)

EAC = (Ac * EF * ED) / AT

*for carcinogens, a conversion is necessary to get into proper units, ug/m3

Chemical	Sc	VF	Ac	EAC for Carcinogens	EAC for Noncarcinogens
1,2-Dichloroethane	1.03E-01	1.41E+04	7.29E-06	1.78E-03	4.99E-06
Aluminum	1.22E+04		1.22E-05	2.98E-03	8.35E-06
Aroclor-1254	7.70E-03		7.70E-12	1.88E-09	5.27E-12
Benzo(a)anthracene	7.20E-01		7.20E-10	1.76E-07	4.93E-10
Benzo(a)pyrene	8.88E-01		8.88E-10	2.17E-07	6.08E-10
Benzo(b)fluoranthene	3.52E-01		3.52E-10	8.61E-08	2.41E-10
Dibenz(a,h)anthracene	2.84E-01		2.84E-10	6.95E-08	1.95E-10
Indeno(1,2,3-cd)pyrene	9.69E-01		9.69E-10	2.37E-07	6.64E-10
Iron	4.11E+04		4.11E-05	1.01E-02	2.82E-05
Tetrachloroethene	1.29E-01	1.51E+03	8.52E-05	2.08E-02	5.83E-05

APPENDIX D

RISK CALCULATIONS

**TABLE D-1
CHEMICAL SPECIFIC TOXICITY VALUES***

Compound	EPA weight-of-evidence classification	CAS Number	Chronic RfD mg/kg-day	Notes:	Inhalation RfC mg/m3	Notes:	Oral Slope Factor 1/mg/kg-day	Notes:	Inhalation Unit Risk 1/ug/m3	Notes:	Dermal Absorption (unitless)	Notes:
4,4-DDD	B2	72-54-8	—		—		2.40E-01		—		1.30E-01	
Aluminum	Not available	7429-90-5	1.00E+00		5.00E-03		—		—		1.00E-02	
Aroclor-1254	B2	1336-36-3	2.00E-05		—		2.00E+00		5.70E-04		1.40E-01	
Arsenic	A	7440-38-2	3.00E-04		—		1.50E+00		4.30E-03		3.00E-02	
Benzo(a)anthracene	B2	56-55-3	—		—		7.30E-01		8.80E-05		1.30E-01	
Benzo(a)pyrene	B2	50-32-8	—		—		7.30E+00		8.80E-04		1.30E-01	
Benzo(b)fluoranthene	B2	205-99-2	—		—		7.30E-01		8.80E-05		1.30E-01	
Benzo(k)fluoranthene	B2	207-08-9	—		—		7.30E-02		8.80E-06		1.30E-01	
Dibenz(a,h)anthracene	B2	53-70-3	—		—		7.30E+00		8.80E-04		1.30E-01	
Dieldrin	B2	60-57-1	5.00E-05		—		1.60E+01		4.60E-03		1.30E-01	
Indeno(1,2,3-cd)pyrene	B2	193-39-5	—		—		7.30E-01		8.80E-05		1.30E-01	
Iron	Not available	7439-89-6	7.00E-01	NCEA, 2006	—		—		—		1.00E-02	
Isopropylbenzene (cumene)	D	98-82-8	1.00E-01		4.00E-01		—		—		1.30E-01	
Lead	B2	7439-92-1	—		—		—		—		1.00E-02	
Napthalene	D	91-20-3	2.00E-02		3.00E-03		—		—		1.30E-01	

Notes:

* Unless otherwise noted, the values were obtained from the EPA's on-line database, IRIS.

TABLE D-2
RISK/HAZARD CALCULATIONS FOR SOIL SOUTH OF MARLIN
AVERAGE – YOUTH TRESPASSER

Cancer Risk = Intake*CSF or EAC * IUR		HQ = Intake / RfD or EAC / RfC				
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				

INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	1.12E-10	3.15E-10	2.70E-11	
Aluminum	--	1.00E+00	9.47E-05	2.65E-04		2.65E-04
Aroclor-1254	2.00E+00	2.00E-05	3.01E-09	8.42E-09	6.02E-09	4.21E-04
Benzo(a)anthracene	7.30E-01	--	3.93E-09	1.10E-08	2.87E-09	
Benzo(a)pyrene	7.30E+00	--	5.09E-09	1.43E-08	3.72E-08	
Benzo(b)fluoranthene	7.30E-01	--	6.84E-09	1.92E-08	4.99E-09	
Benzo(k)fluoranthene	7.30E-02	--	2.30E-09	6.45E-09	1.68E-10	
Dibenz(a,h)anthracene	7.30E+00	--	1.66E-09	4.64E-09	1.21E-08	
Dieldrin	1.60E+01	5.00E-05	1.32E-11	3.70E-11	2.12E-10	7.40E-07
Indeno(1,2,3-cd)pyrene	7.30E-01	--	5.40E-09	1.51E-08	3.94E-09	
Iron	--	7.00E-01	2.10E-04	5.87E-04		8.38E-04
Isopropylbenzene (cumene)	--	1.00E-01	1.22E-08	3.42E-08		3.42E-07
Lead	--	--	7.86E-07	2.20E-06		
Napthalene	--	2.00E-02	4.74E-09	1.33E-08		6.64E-07
PATHWAY TOTAL =					6.75E-08	1.53E-03

DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	5.12E-11	1.43E-10	1.23E-11	
Aluminum	--	1.00E+00	3.31E-06	9.28E-06		9.28E-06
Aroclor-1254	2.00E+00	2.00E-05	1.47E-09	4.13E-09	2.95E-09	2.06E-04
Benzo(a)anthracene	7.30E-01	--	1.79E-09	5.01E-09	1.31E-09	
Benzo(a)pyrene	7.30E+00	--	2.32E-09	6.49E-09	1.69E-08	
Benzo(b)fluoranthene	7.30E-01	--	3.11E-09	8.71E-09	2.27E-09	
Benzo(k)fluoranthene	7.30E-02	--	1.05E-09	2.94E-09	7.65E-11	
Dibenz(a,h)anthracene	7.30E+00	--	7.55E-10	2.11E-09	5.51E-09	
Dieldrin	1.60E+01	5.00E-05	6.02E-12	1.68E-11	9.62E-11	3.37E-07
Indeno(1,2,3-cd)pyrene	7.30E-01	--	2.46E-09	6.88E-09	1.79E-09	
Iron	--	7.00E-01	7.33E-06	2.05E-05		2.93E-05
Isopropylbenzene (cumene)	--	1.00E-01	5.55E-09	1.55E-08		1.55E-07
Lead	--	--	2.75E-08	7.70E-08		
Napthalene	--	2.00E-02	2.16E-09	6.04E-09		3.02E-07
PATHWAY TOTAL =					3.09E-08	2.46E-04

INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
4,4-DDD	--	--	4.63E-12	1.30E-14		
Aluminum	--	5.00E-03	3.13E-05	8.77E-08		1.75E-05
Aroclor-1254	5.70E-04	--	8.04E-10	2.25E-12	4.58E-13	
Benzo(a)anthracene	8.80E-05	--	2.03E-09	5.67E-12	1.78E-13	
Benzo(a)pyrene	8.80E-04	--	2.68E-09	7.51E-12	2.36E-12	
Benzo(b)fluoranthene	8.80E-05	--	3.42E-09	9.57E-12	3.01E-13	
Benzo(k)fluoranthene	8.80E-06	--	1.41E-09	3.95E-12	1.24E-14	
Dibenz(a,h)anthracene	8.80E-04	--	9.10E-10	2.55E-12	8.01E-13	
Dieldrin	4.60E-03	--	5.85E-12	1.64E-14	2.69E-14	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	2.76E-09	7.73E-12	2.43E-13	
Iron	--	--	9.56E-05	2.68E-07		
Isopropylbenzene (cumene)	--	4.00E-01	4.88E-09	1.37E-11		3.42E-11
Lead	--	--	4.09E-07	1.14E-09		
Napthalene	--	3.00E-03	1.90E-09	5.31E-12		1.77E-09
PATHWAY TOTAL =					4.38E-12	1.75E-05
TOTAL					9.85E-08	1.79E-03

TABLE D-3
RISK/HAZARD CALCULATIONS FOR SOIL SOUTH OF MARLIN
RME -- YOUTH TRESPASSER (age 6 to 18)

Cancer Risk = Intake*CSF or EAC * IUR		HQ = Intake / RfD or EAC / RfC				
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)^-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)^-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	—	2.92E-09	8.19E-09	7.02E-10	
Aluminum	—	1.00E+00	4.06E-04	1.14E-03		1.14E-03
Aroclor-1254	2.00E+00	2.00E-05	4.34E-08	1.22E-07	8.69E-08	6.08E-03
Benzo(a)anthracene	7.30E-01	—	5.04E-08	1.41E-07	3.68E-08	
Benzo(a)pyrene	7.30E+00	—	5.92E-08	1.68E-07	4.32E-07	
Benzo(b)fluoranthene	7.30E-01	—	7.37E-08	2.06E-07	5.38E-08	
Benzo(k)fluoranthene	7.30E-02	—	2.22E-08	6.21E-08	1.62E-09	
Dibenz(a,h)anthracene	7.30E+00	—	1.39E-08	3.88E-08	1.01E-07	
Dieldrin	1.60E+01	5.00E-05	1.23E-10	3.45E-10	1.97E-09	6.90E-06
Indeno(1,2,3-cd)pyrene	7.30E-01	—	4.47E-08	1.25E-07	3.26E-08	
Iron	—	7.00E-01	1.02E-03	2.87E-03		4.10E-03
Isopropylbenzene (cumene)	—	1.00E-01	5.06E-07	1.42E-06		1.42E-05
Lead	—	—	6.11E-06	1.71E-05		
Napthalene	—	2.00E-02	1.63E-07	4.56E-07		2.28E-05
PATHWAY TOTAL =					7.48E-07	1.14E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	—	1.33E-09	3.72E-09	3.19E-10	
Aluminum	—	1.00E+00	1.42E-05	3.98E-05		3.98E-05
Aroclor-1254	2.00E+00	2.00E-05	2.13E-08	5.96E-08	4.26E-08	2.98E-03
Benzo(a)anthracene	7.30E-01	—	2.29E-08	6.42E-08	1.68E-08	
Benzo(a)pyrene	7.30E+00	—	2.69E-08	7.54E-08	1.97E-07	
Benzo(b)fluoranthene	7.30E-01	—	3.36E-08	9.39E-08	2.45E-08	
Benzo(k)fluoranthene	7.30E-02	—	1.01E-08	2.83E-08	7.37E-10	
Dibenz(a,h)anthracene	7.30E+00	—	6.30E-09	1.77E-08	4.60E-08	
Dieldrin	1.60E+01	5.00E-05	5.61E-11	1.57E-10	8.98E-10	3.14E-06
Indeno(1,2,3-cd)pyrene	7.30E-01	—	2.03E-08	5.69E-08	1.48E-08	
Iron	—	7.00E-01	3.59E-05	1.00E-04		1.43E-04
Isopropylbenzene (cumene)	—	1.00E-01	2.30E-07	6.45E-07		6.45E-06
Lead	—	—	2.14E-07	5.98E-07		
Napthalene	—	2.00E-02	7.41E-08	2.08E-07		1.04E-05
PATHWAY TOTAL =					3.43E-07	3.18E-03
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
4,4-DDD	—	—	6.81E-11	1.91E-13		
Aluminum	—	5.00E-03	1.40E-04	3.91E-07		7.82E-05
Aroclor-1254	5.70E-04	—	1.70E-08	4.77E-11	9.72E-12	
Benzo(a)anthracene	8.80E-05	—	2.84E-08	7.96E-11	2.50E-12	
Benzo(a)pyrene	8.80E-04	—	3.42E-08	9.58E-11	3.01E-11	
Benzo(b)fluoranthene	8.80E-05	—	3.85E-08	1.08E-10	3.38E-12	
Benzo(k)fluoranthene	8.80E-06	—	1.53E-08	4.28E-11	1.35E-13	
Dibenz(a,h)anthracene	8.80E-04	—	8.52E-09	2.39E-11	7.50E-12	
Dieldrin	4.60E-03	—	7.05E-11	1.97E-13	3.24E-13	
Indeno(1,2,3-cd)pyrene	8.80E-05	—	2.62E-08	7.33E-11	2.30E-12	
Iron	—	—	4.19E-04	1.17E-06		
Isopropylbenzene (cumene)	—	4.00E-01	2.02E-07	5.67E-10		1.42E-09
Lead	—	—	1.98E-06	5.56E-09		
Napthalene	—	3.00E-03	6.52E-08	1.82E-10		6.08E-08
PATHWAY TOTAL =					5.60E-11	7.83E-05
TOTAL					1.09E-06	1.46E-02

TABLE D-4
RISK/HAZARD CALCULATIONS FOR SOIL SOUTH OF MARLIN
AVERAGE – CONSTRUCTION WORKER

Cancer Risk = Intake*CSF or EAC * IUR		HQ = Intake / RfD or EAC / RfC				
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)^-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)^-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	6.36E-11	4.45E-09	1.53E-11	
Aluminum	--	1.00E+00	5.36E-05	3.75E-03		3.75E-03
Aroclor-1254	2.00E+00	2.00E-05	1.70E-09	1.19E-07	3.40E-09	5.96E-03
Benzo(a)anthracene	7.30E-01	--	2.23E-09	1.56E-07	1.62E-09	
Benzo(a)pyrene	7.30E+00	--	2.88E-09	2.02E-07	2.10E-08	
Benzo(b)fluoranthene	7.30E-01	--	3.87E-09	2.71E-07	2.82E-09	
Benzo(k)fluoranthene	7.30E-02	--	1.30E-09	9.13E-08	9.52E-11	
Dibenz(a,h)anthracene	7.30E+00	--	9.38E-10	6.57E-08	6.85E-09	
Dieldrin	1.60E+01	5.00E-05	7.48E-12	5.24E-10	1.20E-10	1.05E-05
Indeno(1,2,3-cd)pyrene	7.30E-01	--	3.06E-09	2.14E-07	2.23E-09	
Iron	--	7.00E-01	1.19E-04	8.30E-03		1.19E-02
Isopropylbenzene (cumene)	--	1.00E-01	6.90E-09	4.83E-07		4.83E-06
Lead	--	--	4.44E-07	3.11E-05		
Napthalene	--	2.00E-02	2.68E-09	1.88E-07		9.39E-06
PATHWAY TOTAL =					3.82E-08	2.16E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	2.32E-11	1.62E-09	5.56E-12	
Aluminum	--	1.00E+00	1.50E-06	1.05E-04		1.05E-04
Aroclor-1254	2.00E+00	2.00E-05	6.67E-10	4.67E-08	1.33E-09	2.34E-03
Benzo(a)anthracene	7.30E-01	--	8.10E-10	5.67E-08	5.91E-10	
Benzo(a)pyrene	7.30E+00	--	1.05E-09	7.34E-08	7.66E-09	
Benzo(b)fluoranthene	7.30E-01	--	1.41E-09	9.86E-08	1.03E-09	
Benzo(k)fluoranthene	7.30E-02	--	4.75E-10	3.32E-08	3.46E-11	
Dibenz(a,h)anthracene	7.30E+00	--	3.42E-10	2.39E-08	2.49E-09	
Dieldrin	1.60E+01	5.00E-05	2.72E-12	1.91E-10	4.36E-11	3.81E-06
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.11E-09	7.79E-08	8.12E-10	
Iron	--	7.00E-01	3.32E-06	2.32E-04		3.32E-04
Isopropylbenzene (cumene)	--	1.00E-01	2.51E-09	1.76E-07		1.76E-06
Lead	--	--	1.24E-08	8.71E-07		
Napthalene	--	2.00E-02	9.76E-10	6.83E-08		3.42E-06
PATHWAY TOTAL =					1.40E-08	2.78E-03
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
4,4-DDD	--	--	2.78E-12	1.95E-13		
Aluminum	--	5.00E-03	1.88E-05	1.32E-06		2.63E-04
Aroclor-1254	5.70E-04	--	4.83E-10	3.38E-11	2.75E-13	
Benzo(a)anthracene	8.80E-05	--	1.22E-09	8.51E-11	1.07E-13	
Benzo(a)pyrene	8.80E-04	--	1.61E-09	1.13E-10	1.42E-12	
Benzo(b)fluoranthene	8.80E-05	--	2.05E-09	1.44E-10	1.80E-13	
Benzo(k)fluoranthene	8.80E-06	--	8.45E-10	5.92E-11	7.44E-15	
Dibenz(a,h)anthracene	8.80E-04	--	5.46E-10	3.82E-11	4.80E-13	
Dieldrin	4.60E-03	--	3.51E-12	2.46E-13	1.62E-14	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	1.66E-09	1.16E-10	1.46E-13	
Iron	--	--	5.74E-05	4.02E-06		
Isopropylbenzene (cumene)	--	4.00E-01	2.93E-09	2.05E-10		5.12E-10
Lead	--	--	2.45E-07	1.72E-08		
Napthalene	--	3.00E-03	1.14E-09	7.96E-11		2.65E-08
PATHWAY TOTAL =					2.63E-12	2.63E-04
TOTAL					5.22E-08	2.46E-02

TABLE D-5
RISK/HAZARD CALCULATIONS FOR SOIL SOUTH OF MARLIN
RME -- CONSTRUCTION WORKER

Cancer Risk = Intake*CSF or EAC * IUR		HQ = Intake / RfD or EAC / RfC				
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	2.30E-09	1.81E-07	5.51E-10	
Aluminum	--	1.00E+00	3.19E-04	2.23E-02		2.23E-02
Aroclor-1254	2.00E+00	2.00E-05	3.41E-08	2.39E-06	6.83E-08	1.19E-01
Benzo(a)anthracene	7.30E-01	--	3.96E-08	2.77E-06	2.89E-08	
Benzo(a)pyrene	7.30E+00	--	4.65E-08	3.25E-06	3.39E-07	
Benzo(b)fluoranthene	7.30E-01	--	5.79E-08	4.06E-06	4.23E-08	
Benzo(k)fluoranthene	7.30E-02	--	1.74E-08	1.22E-06	1.27E-09	
Dibenz(a,h)anthracene	7.30E+00	--	1.09E-08	7.62E-07	7.95E-08	
Dieldrin	1.60E+01	5.00E-05	9.69E-11	6.78E-09	1.55E-09	1.36E-04
Indeno(1,2,3-cd)pyrene	7.30E-01	--	3.51E-08	2.46E-06	2.56E-08	
Iron	--	7.00E-01	8.05E-04	5.64E-02		8.05E-02
Isopropylbenzene (cumene)	--	1.00E-01	3.98E-07	2.78E-05		2.78E-04
Lead	--	--	4.80E-06	3.36E-04		
Napthalene	--	2.00E-02	1.28E-07	8.96E-06		4.48E-04
PATHWAY TOTAL =					5.87E-07	2.23E-01
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	8.96E-10	6.27E-08	2.15E-10	
Aluminum	--	1.00E+00	9.57E-06	6.70E-04		6.70E-04
Aroclor-1254	2.00E+00	2.00E-05	1.43E-08	1.00E-06	2.87E-08	5.02E-02
Benzo(a)anthracene	7.30E-01	--	1.55E-08	1.08E-06	1.13E-08	
Benzo(a)pyrene	7.30E+00	--	1.81E-08	1.27E-06	1.32E-07	
Benzo(b)fluoranthene	7.30E-01	--	2.26E-08	1.58E-06	1.65E-08	
Benzo(k)fluoranthene	7.30E-02	--	6.80E-09	4.76E-07	4.96E-10	
Dibenz(a,h)anthracene	7.30E+00	--	4.25E-09	2.97E-07	3.10E-08	
Dieldrin	1.60E+01	5.00E-05	3.78E-11	2.64E-09	6.04E-10	5.29E-05
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.37E-08	9.58E-07	9.99E-09	
Iron	--	7.00E-01	2.42E-05	1.69E-03		2.42E-03
Isopropylbenzene (cumene)	--	1.00E-01	1.55E-07	1.09E-05		1.09E-04
Lead	--	--	1.44E-07	1.01E-05		
Napthalene	--	2.00E-02	4.99E-08	3.49E-06		1.75E-04
PATHWAY TOTAL =					2.31E-07	5.36E-02
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
4,4-DDD	--	--	2.84E-11	1.99E-12		
Aluminum	--	5.00E-03	5.82E-05	4.07E-06		8.15E-04
Aroclor-1254	5.70E-04	--	7.10E-09	4.97E-10	4.05E-12	
Benzo(a)anthracene	8.80E-05	--	1.18E-08	8.29E-10	1.04E-12	
Benzo(a)pyrene	8.80E-04	--	1.43E-08	9.98E-10	1.25E-11	
Benzo(b)fluoranthene	8.80E-05	--	1.60E-08	1.12E-09	1.41E-12	
Benzo(k)fluoranthene	8.80E-06	--	6.37E-09	4.46E-10	5.61E-14	
Dibenz(a,h)anthracene	8.80E-04	--	3.55E-09	2.49E-10	3.13E-12	
Dieldrin	4.60E-03	--	2.94E-11	2.05E-12	1.35E-13	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	1.09E-08	7.64E-10	9.60E-13	
Iron	--	--	1.75E-04	1.22E-05		
Isopropylbenzene (cumene)	--	4.00E-01	8.43E-08	5.90E-09		1.48E-08
Lead	--	--	8.27E-07	5.79E-08		
Napthalene	--	3.00E-03	2.72E-08	1.90E-09		6.34E-07
PATHWAY TOTAL =					2.33E-11	6.48E-07
TOTAL					8.19E-07	2.77E-01

TABLE D-6
RISK/HAZARD CALCULATIONS FOR SOIL SOUTH OF MARLIN
AVERAGE - INDUSTRIAL WORKER

Cancer Risk = Intake*CSF or EAC * IUR		HQ = Intake / RfD or EAC / RfC				
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)^-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)^-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	-	1.34E-09	3.75E-09	3.21E-10	
Aluminum	-	1.00E+00	1.13E-03	3.16E-03		3.16E-03
Aroclor-1254	2.00E+00	2.00E-05	3.58E-08	1.00E-07	7.16E-08	5.01E-03
Benzo(a)anthracene	7.30E-01	-	4.68E-08	1.31E-07	3.42E-08	
Benzo(a)pyrene	7.30E+00	-	6.06E-08	1.70E-07	4.43E-07	
Benzo(b)fluoranthene	7.30E-01	-	8.14E-08	2.28E-07	5.94E-08	
Benzo(k)fluoranthene	7.30E-02	-	2.74E-08	7.68E-08	2.00E-09	
Dibenz(a,h)anthracene	7.30E+00	-	1.97E-08	5.53E-08	1.44E-07	
Dieldrin	1.60E+01	5.00E-05	1.57E-10	4.41E-10	2.52E-09	8.81E-06
Indeno(1,2,3-cd)pyrene	7.30E-01	-	6.43E-08	1.80E-07	4.69E-08	
Iron	-	7.00E-01	2.49E-03	6.98E-03		9.98E-03
Isopropylbenzene (cumene)	-	1.00E-01	1.45E-07	4.07E-07		4.07E-06
Lead	-	-	9.35E-06	2.62E-05		
Napthalene	-	2.00E-02	5.64E-08	1.58E-07		7.90E-06
PATHWAY TOTAL =					8.04E-07	1.82E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	-	2.41E-10	6.75E-10	5.79E-11	
Aluminum	-	1.00E+00	1.56E-05	4.37E-05		4.37E-05
Aroclor-1254	2.00E+00	2.00E-05	6.95E-09	1.95E-08	1.39E-08	9.73E-04
Benzo(a)anthracene	7.30E-01	-	8.44E-09	2.36E-08	6.16E-09	
Benzo(a)pyrene	7.30E+00	-	1.09E-08	3.06E-08	7.97E-08	
Benzo(b)fluoranthene	7.30E-01	-	1.47E-08	4.11E-08	1.07E-08	
Benzo(k)fluoranthene	7.30E-02	-	4.94E-09	1.38E-08	3.61E-10	
Dibenz(a,h)anthracene	7.30E+00	-	3.56E-09	9.96E-09	2.60E-08	
Dieldrin	1.60E+01	5.00E-05	2.84E-11	7.94E-11	4.54E-10	1.59E-06
Indeno(1,2,3-cd)pyrene	7.30E-01	-	1.16E-08	3.24E-08	8.46E-09	
Iron	-	7.00E-01	3.46E-05	9.68E-05		1.38E-04
Isopropylbenzene (cumene)	-	1.00E-01	2.62E-08	7.33E-08		7.33E-07
Lead	-	-	1.30E-07	3.63E-07		
Napthalene	-	2.00E-02	1.02E-08	2.85E-08		1.42E-06
PATHWAY TOTAL =					1.46E-07	1.16E-03
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
4,4-DDD	-	-	1.93E-10	5.41E-13		
Aluminum	-	5.00E-03	1.31E-03	3.65E-06		7.31E-04
Aroclor-1254	5.70E-04	-	3.35E-08	9.38E-11	1.91E-11	
Benzo(a)anthracene	8.80E-05	-	8.44E-08	2.36E-10	7.43E-12	
Benzo(a)pyrene	8.80E-04	-	1.12E-07	3.13E-10	9.84E-11	
Benzo(b)fluoranthene	8.80E-05	-	1.42E-07	3.99E-10	1.25E-11	
Benzo(k)fluoranthene	8.80E-06	-	5.87E-08	1.64E-10	5.17E-13	
Dibenz(a,h)anthracene	8.80E-04	-	3.79E-08	1.06E-10	3.34E-11	
Dieldrin	4.60E-03	-	2.44E-10	6.83E-13	1.12E-12	
Indeno(1,2,3-cd)pyrene	8.80E-05	-	1.15E-07	3.22E-10	1.01E-11	
Iron	-	-	3.98E-03	1.12E-05		
Isopropylbenzene (cumene)	-	4.00E-01	2.03E-07	5.69E-10		1.42E-09
Lead	-	-	1.70E-05	4.77E-08		
Napthalene	-	3.00E-03	7.90E-08	2.21E-10		7.37E-08
PATHWAY TOTAL =					1.83E-10	7.31E-04
TOTAL					9.50E-07	2.01E-02

TABLE D-7
RISK/HAZARD CALCULATIONS FOR SOIL SOUTH OF MARLIN
RME -- INDUSTRIAL WORKER

Cancer Risk = Intake*CSF or EAC * IUR		HQ = Intake / RfD or EAC / RfC				
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)^-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)^-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	8.70E-09	2.44E-08	2.09E-09	
Aluminum	--	1.00E+00	1.21E-03	3.38E-03		3.38E-03
Aroclor-1254	2.00E+00	2.00E-05	1.29E-07	3.62E-07	2.59E-07	1.81E-02
Benzo(a)anthracene	7.30E-01	--	1.50E-07	4.20E-07	1.10E-07	
Benzo(a)pyrene	7.30E+00	--	1.76E-07	4.93E-07	1.29E-06	
Benzo(b)fluoranthene	7.30E-01	--	2.19E-07	6.14E-07	1.60E-07	
Benzo(k)fluoranthene	7.30E-02	--	6.60E-08	1.85E-07	4.82E-09	
Dibenz(a,h)anthracene	7.30E+00	--	4.12E-08	1.15E-07	3.01E-07	
Dieldrin	1.60E+01	5.00E-05	3.67E-10	1.03E-09	5.87E-09	2.05E-05
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.33E-07	3.72E-07	9.71E-08	
Iron	--	7.00E-01	3.05E-03	8.54E-03		1.22E-02
Isopropylbenzene (cumene)	--	1.00E-01	1.51E-06	4.22E-06		4.22E-05
Lead	--	--	1.82E-05	5.09E-05		
Napthalene	--	2.00E-02	4.85E-07	1.36E-06		6.79E-05
PATHWAY TOTAL =					2.22E-06	3.38E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
4,4-DDD	2.40E-01	--	1.49E-08	4.18E-08	3.58E-09	
Aluminum	--	1.00E+00	1.59E-04	4.47E-04		4.47E-04
Aroclor-1254	2.00E+00	2.00E-05	2.39E-07	6.69E-07	4.78E-07	3.35E-02
Benzo(a)anthracene	7.30E-01	--	2.58E-07	7.21E-07	1.88E-07	
Benzo(a)pyrene	7.30E+00	--	3.02E-07	8.46E-07	2.21E-06	
Benzo(b)fluoranthene	7.30E-01	--	3.77E-07	1.05E-06	2.75E-07	
Benzo(k)fluoranthene	7.30E-02	--	1.13E-07	3.17E-07	8.27E-09	
Dibenz(a,h)anthracene	7.30E+00	--	7.08E-08	1.98E-07	5.17E-07	
Dieldrin	1.60E+01	5.00E-05	6.30E-10	1.76E-09	1.01E-08	3.53E-05
Indeno(1,2,3-cd)pyrene	7.30E-01	--	2.28E-07	6.39E-07	1.67E-07	
Iron	--	7.00E-01	4.03E-04	1.13E-03		1.61E-03
Isopropylbenzene (cumene)	--	1.00E-01	2.58E-06	7.24E-06		7.24E-05
Lead	--	--	2.40E-06	6.72E-06		
Napthalene	--	2.00E-02	8.32E-07	2.33E-06		1.16E-04
PATHWAY TOTAL =					3.85E-06	3.57E-02
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
4,4-DDD	--	--	7.09E-10	1.99E-12		
Aluminum	--	5.00E-03	1.45E-03	4.07E-06		8.15E-04
Aroclor-1254	5.70E-04	--	1.78E-07	4.97E-10	1.01E-10	
Benzo(a)anthracene	8.80E-05	--	2.96E-07	8.29E-10	2.61E-11	
Benzo(a)pyrene	8.80E-04	--	3.56E-07	9.98E-10	3.14E-10	
Benzo(b)fluoranthene	8.80E-05	--	4.01E-07	1.12E-09	3.53E-11	
Benzo(k)fluoranthene	8.80E-06	--	1.59E-07	4.46E-10	1.40E-12	
Dibenz(a,h)anthracene	8.80E-04	--	8.88E-08	2.49E-10	7.81E-11	
Dieldrin	4.60E-03	--	7.34E-10	2.05E-12	3.38E-12	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	2.73E-07	7.64E-10	2.40E-11	
Iron	--	--	4.37E-03	1.22E-05		
Isopropylbenzene (cumene)	--	4.00E-01	2.11E-06	5.90E-09		1.48E-08
Lead	--	--	2.07E-05	5.79E-08		
Napthalene	--	3.00E-03	6.79E-07	1.90E-09		6.34E-07
PATHWAY TOTAL =					5.83E-10	8.15E-04
TOTAL					6.08E-06	7.04E-02

TABLE D-8
CHEMICAL SPECIFIC TOXICITY VALUES*

Compound	EPA weight-of-evidence classification	CAS Number	Chronic RfD mg/kg-day	Notes:	Inhalation RfC mg/m3	Notes:	Oral Slope Factor 1/mg/kg-day	Notes:	Inhalation Unit Risk 1/ug/m3	Notes:	Dermal Absorption (unitless)	Notes:
1,2-Dichloroethane	B2	107-06-2	2.00E-02		2.40E+00		9.10E-02		2.60E-05		1.30E-01	
Aluminum	Not available	7429-90-5	1.00E-01		5.00E-03		—		—		1.00E-02	
Aroclor-1254	B2	1336-36-3	2.00E-05		—		2.00E+00		5.70E-04		1.30E-01	
Benzo(a)anthracene	B2	56-55-3	—		—		7.30E-01		8.80E-05		1.30E-01	
Benzo(a)pyrene	B2	50-32-8	—		—		7.30E+00		8.80E-04		1.30E-01	
Benzo(b)fluoranthene	B2	205-99-2	—		—		7.30E-01		8.80E-05		1.30E-01	
Dibenz(a,h)anthracene	B2	53-70-3	—		—		7.30E+00		8.80E-04		1.30E-01	
Indeno(1,2,3-cd)pyrene	B2	193-39-5	—		—		7.30E-01		8.80E-05		1.30E-01	
Iron	Not available	7439-89-6	7.00E-01	NCEA, 2006	—		—		—		1.00E-02	
Tetrachloroethene	B2	127-18-4	1.00E-02		2.70E-01		5.20E-02		5.80E-07		1.30E-01	

Notes:

* Unless otherwise noted, the values were obtained from EPA's on-line database, IRIS.

**TABLE D-9
RISK/HAZARD CALCULATIONS FOR SOIL NORTH OF MARLIN
AVERAGE -- YOUTH TRESPASSER**

Cancer Risk =	Intake*CSF or EAC * IUR	HQ =	Intake / RfD or EAC / RfC			
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	1.56E-10	4.36E-10	1.42E-11	2.18E-08
Aluminum	--	1.00E-01	1.76E-04	4.92E-04		4.92E-03
Aroclor-1254	2.00E+00	2.00E-05	8.22E-11	2.30E-10	1.64E-10	1.15E-05
Benzo(a)anthracene	7.30E-01	--	9.98E-10	2.79E-09	7.29E-10	
Benzo(a)pyrene	7.30E+00	--	1.35E-09	3.79E-09	9.88E-09	
Benzo(b)fluoranthene	7.30E-01	--	1.76E-09	4.93E-09	1.29E-09	
Dibenz(a,h)anthracene	7.30E+00	--	5.64E-10	1.58E-09	4.11E-09	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.95E-09	5.47E-09	1.43E-09	
Iron	--	7.00E-01	2.57E-04	7.20E-04		1.03E-03
Tetrachloroethene	5.20E-02	1.00E-02	1.86E-10	5.22E-10	9.69E-12	5.22E-08
PATHWAY TOTAL =					1.76E-08	5.96E-03
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	7.08E-11	1.98E-10	6.44E-12	9.91E-09
Aluminum	--	1.00E-01	6.15E-06	1.72E-05		1.72E-04
Aroclor-1254	2.00E+00	2.00E-05	3.74E-11	1.05E-10	7.48E-11	5.24E-06
Benzo(a)anthracene	7.30E-01	--	4.54E-10	1.27E-09	3.32E-10	
Benzo(a)pyrene	7.30E+00	--	6.16E-10	1.72E-09	4.49E-09	
Benzo(b)fluoranthene	7.30E-01	--	8.01E-10	2.24E-09	5.85E-10	
Dibenz(a,h)anthracene	7.30E+00	--	2.56E-10	7.18E-10	1.87E-09	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	8.88E-10	2.49E-09	6.48E-10	
Iron	--	7.00E-01	9.01E-06	2.52E-05		3.60E-05
Tetrachloroethene	5.20E-02	1.00E-02	8.48E-11	2.37E-10	4.41E-12	2.37E-08
PATHWAY TOTAL =					8.02E-09	2.13E-04
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	2.60E-05	2.40E+00	4.40E-06	1.23E-08		
Aluminum	--	5.00E-03	6.27E-05	1.75E-07		3.51E-05
Aroclor-1254	5.70E-04	--	2.17E-11	6.08E-14	1.24E-14	
Benzo(a)anthracene	8.80E-05	--	4.20E-10	1.18E-12	3.69E-14	
Benzo(a)pyrene	8.80E-04	--	6.69E-10	1.87E-12	5.89E-13	
Benzo(b)fluoranthene	8.80E-05	--	8.57E-10	2.40E-12	7.54E-14	
Dibenz(a,h)anthracene	8.80E-04	--	2.77E-10	7.74E-13	2.43E-13	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	8.86E-10	2.48E-12	7.80E-14	
Iron	--	--	1.14E-04	3.20E-07		
Tetrachloroethene	5.80E-07	2.70E-01	4.92E-05	1.38E-07	2.86E-11	5.10E-07
PATHWAY TOTAL =					2.96E-11	3.56E-05
TOTAL					2.57E-08	6.21E-03

TABLE D-10
RISK/HAZARD CALCULATIONS FOR SOIL NORTH OF MARLIN
RME -- YOUTH TRESPASSER (age 6 to 18)

Cancer Risk =	Intake*CSF or EAC * IUR	HQ =	Intake / RfD or EAC / RfC			
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	6.05E-09	1.69E-08	5.50E-10	8.47E-07
Aluminum	--	1.00E-01	7.69E-04	2.15E-03		2.15E-02
Aroclor-1254	2.00E+00	2.00E-05	9.86E-10	2.76E-09	1.97E-09	1.38E-04
Benzo(a)anthracene	7.30E-01	--	2.72E-08	7.63E-08	1.99E-08	
Benzo(a)pyrene	7.30E+00	--	3.25E-08	9.11E-08	2.37E-07	
Benzo(b)fluoranthene	7.30E-01	--	3.81E-08	1.07E-07	2.78E-08	
Dibenz(a,h)anthracene	7.30E+00	--	1.04E-08	2.91E-08	7.59E-08	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	3.39E-08	9.48E-08	2.47E-08	
Iron	--	7.00E-01	1.28E-03	3.58E-03		5.11E-03
Tetrachloroethene	5.20E-02	1.00E-02	7.57E-09	2.12E-08	3.94E-10	2.12E-06
PATHWAY TOTAL =					3.89E-07	2.68E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	2.75E-09	7.70E-09	2.50E-10	3.85E-07
Aluminum	--	1.00E-01	2.69E-05	7.53E-05		7.53E-04
Aroclor-1254	2.00E+00	2.00E-05	4.49E-10	1.26E-09	8.98E-10	6.28E-05
Benzo(a)anthracene	7.30E-01	--	1.24E-08	3.47E-08	9.05E-09	
Benzo(a)pyrene	7.30E+00	--	1.48E-08	4.14E-08	1.08E-07	
Benzo(b)fluoranthene	7.30E-01	--	1.73E-08	4.85E-08	1.27E-08	
Dibenz(a,h)anthracene	7.30E+00	--	4.73E-09	1.32E-08	3.45E-08	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.54E-08	4.32E-08	1.13E-08	
Iron	--	7.00E-01	4.47E-05	1.25E-04		1.79E-04
Tetrachloroethene	5.20E-02	1.00E-02	3.45E-09	9.65E-09	1.79E-10	9.65E-07
PATHWAY TOTAL =					1.77E-07	9.96E-04
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	2.60E-05	2.40E+00	1.71E-04	4.79E-07	4.45E-09	2.00E-07
Aluminum	--	5.00E-03	2.86E-04	8.01E-07		1.60E-04
Aroclor-1254	5.70E-04	--	1.81E-10	5.06E-13	1.03E-13	
Benzo(a)anthracene	8.80E-05	--	1.69E-08	4.73E-11	1.49E-12	
Benzo(a)pyrene	8.80E-04	--	2.09E-08	5.84E-11	1.84E-11	
Benzo(b)fluoranthene	8.80E-05	--	8.27E-09	2.31E-11	7.27E-13	
Dibenz(a,h)anthracene	8.80E-04	--	6.67E-09	1.87E-11	5.87E-12	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	2.28E-08	6.37E-11	2.00E-12	
Iron	--	--	9.66E-04	2.70E-06		
Tetrachloroethene	5.80E-07	2.70E-01	2.00E-03	5.60E-06	1.16E-09	2.07E-05
PATHWAY TOTAL =					5.64E-09	1.81E-04
TOTAL					5.71E-07	2.80E-02

TABLE D-11
RISK/HAZARD CALCULATIONS FOR SOIL NORTH OF MARLIN
AVERAGE -- CONSTRUCTION WORKER

Cancer Risk =	Intake*CSF or EAC * IUR	HQ =	Intake / RfD or EAC / RfC			
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	8.80E-11	6.16E-09	8.01E-12	3.08E-07
Aluminum	--	1.00E-01	9.94E-05	6.96E-03		6.96E-02
Aroclor-1254	2.00E+00	2.00E-05	4.65E-11	3.25E-09	9.30E-11	1.63E-04
Benzo(a)anthracene	7.30E-01	--	5.65E-10	3.95E-08	4.12E-10	
Benzo(a)pyrene	7.30E+00	--	7.66E-10	5.36E-08	5.59E-09	
Benzo(b)fluoranthene	7.30E-01	--	9.96E-10	6.97E-08	7.27E-10	
Dibenz(a,h)anthracene	7.30E+00	--	3.19E-10	2.23E-08	2.33E-09	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.10E-09	7.73E-08	8.06E-10	
Iron	--	7.00E-01	1.46E-04	1.02E-02		1.46E-02
Tetrachloroethene	5.20E-02	1.00E-02	1.05E-10	7.38E-09	5.48E-12	7.38E-07
PATHWAY TOTAL =					9.97E-09	8.43E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	3.20E-11	2.24E-09	2.92E-12	1.12E-07
Aluminum	--	1.00E-01	2.78E-06	1.95E-04		1.95E-03
Aroclor-1254	2.00E+00	2.00E-05	1.69E-11	1.18E-09	3.38E-11	5.92E-05
Benzo(a)anthracene	7.30E-01	--	2.06E-10	1.44E-08	1.50E-10	
Benzo(a)pyrene	7.30E+00	--	2.79E-10	1.95E-08	2.03E-09	
Benzo(b)fluoranthene	7.30E-01	--	3.63E-10	2.54E-08	2.65E-10	
Dibenz(a,h)anthracene	7.30E+00	--	1.16E-10	8.12E-09	8.47E-10	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	4.02E-10	2.81E-08	2.93E-10	
Iron	--	7.00E-01	4.08E-06	2.85E-04		4.08E-04
Tetrachloroethene	5.20E-02	1.00E-02	3.84E-11	2.69E-09	2.00E-12	2.69E-07
PATHWAY TOTAL =					3.63E-09	2.42E-03
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	2.60E-05	2.40E+00	2.64E-06	1.85E-07	6.87E-11	7.71E-08
Aluminum	--	5.00E-03	3.76E-05	2.63E-06		5.26E-04
Aroclor-1254	5.70E-04	--	1.30E-11	9.12E-13	7.43E-15	
Benzo(a)anthracene	8.80E-05	--	2.52E-10	1.76E-11	2.22E-14	
Benzo(a)pyrene	8.80E-04	--	4.02E-10	2.81E-11	3.53E-13	
Benzo(b)fluoranthene	8.80E-05	--	5.14E-10	3.60E-11	4.53E-14	
Dibenz(a,h)anthracene	8.80E-04	--	1.66E-10	1.16E-11	1.46E-13	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	5.32E-10	3.72E-11	4.68E-14	
Iron	--	--	6.86E-05	4.80E-06		
Tetrachloroethene	5.80E-07	2.70E-01	2.95E-05	2.07E-06	1.71E-11	7.66E-06
PATHWAY TOTAL =					8.65E-11	5.34E-04
TOTAL					1.37E-08	8.72E-02

TABLE D-12
RISK/HAZARD CALCULATIONS FOR SOIL NORTH OF MARLIN
RME -- CONSTRUCTION WORKER

Cancer Risk =	Intake*CSF or EAC * IUR	HQ =	Intake / RfD or EAC / RfC			
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see Intake				
EAC	Effective Air Concentration (mg/m^3)	see Intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	4.75E-09	3.33E-07	4.32E-10	1.66E-05
Aluminum	--	1.00E-01	6.04E-04	4.23E-02		4.23E-01
Aroclor-1254	2.00E+00	2.00E-05	7.75E-10	5.42E-08	1.55E-09	2.71E-03
Benzo(a)anthracene	7.30E-01	--	2.14E-08	1.50E-06	1.56E-08	
Benzo(a)pyrene	7.30E+00	--	2.56E-08	1.79E-06	1.87E-07	
Benzo(b)fluoranthene	7.30E-01	--	2.99E-08	2.10E-06	2.19E-08	
Dibenz(a,h)anthracene	7.30E+00	--	8.16E-09	5.72E-07	5.96E-08	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	2.66E-08	1.86E-06	1.94E-08	
Iron	--	7.00E-01	1.00E-03	7.03E-02		1.00E-01
Tetrachloroethene	5.20E-02	1.00E-02	5.95E-09	4.17E-07	3.09E-10	4.17E-05
PATHWAY TOTAL =					3.05E-07	5.26E-01
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	1.85E-09	1.30E-07	1.69E-10	6.49E-06
Aluminum	--	1.00E-01	1.81E-05	1.27E-03		1.27E-02
Aroclor-1254	2.00E+00	2.00E-05	3.02E-10	2.12E-08	6.04E-10	1.06E-03
Benzo(a)anthracene	7.30E-01	--	8.35E-09	5.84E-07	6.09E-09	
Benzo(a)pyrene	7.30E+00	--	9.97E-09	6.98E-07	7.28E-08	
Benzo(b)fluoranthene	7.30E-01	--	1.17E-08	8.17E-07	8.52E-09	
Dibenz(a,h)anthracene	7.30E+00	--	3.18E-09	2.23E-07	2.32E-08	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.04E-08	7.27E-07	7.58E-09	
Iron	--	7.00E-01	3.01E-05	2.11E-03		3.01E-03
Tetrachloroethene	5.20E-02	1.00E-02	2.32E-09	1.62E-07	1.21E-10	1.62E-05
PATHWAY TOTAL =					1.19E-07	1.68E-02
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	2.60E-05	2.40E+00	7.13E-05	4.99E-06	1.85E-09	2.08E-06
Aluminum	--	5.00E-03	1.19E-04	8.35E-06		1.67E-03
Aroclor-1254	5.70E-04	--	7.53E-11	5.27E-12	4.29E-14	
Benzo(a)anthracene	8.80E-05	--	7.05E-09	4.93E-10	6.20E-13	
Benzo(a)pyrene	8.80E-04	--	8.69E-09	6.08E-10	7.65E-12	
Benzo(b)fluoranthene	8.80E-05	--	3.44E-09	2.41E-10	3.03E-13	
Dibenz(a,h)anthracene	8.80E-04	--	2.78E-09	1.95E-10	2.45E-12	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	9.48E-09	6.64E-10	8.34E-13	
Iron	--	--	4.02E-04	2.82E-05		
Tetrachloroethene	5.80E-07	2.70E-01	8.33E-04	5.83E-05	4.83E-10	2.16E-04
PATHWAY TOTAL =					2.35E-09	1.89E-03
TOTAL					4.27E-07	5.45E-01

TABLE D-13
RISK/HAZARD CALCULATIONS FOR SOIL NORTH OF MARLIN
AVERAGE -- INDUSTRIAL WORKER

Cancer Risk =	Intake*CSF or EAC * IUR	HQ =	Intake / RfD or EAC / RfC			
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	1.85E-09	5.19E-09	1.69E-10	2.59E-07
Aluminum	--	1.00E-01	2.09E-03	5.86E-03		5.86E-02
Aroclor-1254	2.00E+00	2.00E-05	9.78E-10	2.74E-09	1.96E-09	1.37E-04
Benzo(a)anthracene	7.30E-01	--	1.19E-08	3.33E-08	8.67E-09	
Benzo(a)pyrene	7.30E+00	--	1.61E-08	4.51E-08	1.18E-07	
Benzo(b)fluoranthene	7.30E-01	--	2.10E-08	5.87E-08	1.53E-08	
Dibenz(a,h)anthracene	7.30E+00	--	6.71E-09	1.88E-08	4.90E-08	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	2.32E-08	6.51E-08	1.70E-08	
Iron	--	7.00E-01	3.06E-03	8.58E-03		1.23E-02
Tetrachloroethene	5.20E-02	1.00E-02	2.22E-09	6.21E-09	1.15E-10	6.21E-07
PATHWAY TOTAL =					2.10E-07	7.10E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	3.34E-10	9.34E-10	3.04E-11	4.67E-08
Aluminum	--	1.00E-01	2.90E-05	8.12E-05		8.12E-04
Aroclor-1254	2.00E+00	2.00E-05	1.76E-10	4.94E-10	3.53E-10	2.47E-05
Benzo(a)anthracene	7.30E-01	--	2.14E-09	5.99E-09	1.56E-09	
Benzo(a)pyrene	7.30E+00	--	2.90E-09	8.13E-09	2.12E-08	
Benzo(b)fluoranthene	7.30E-01	--	3.78E-09	1.06E-08	2.76E-09	
Dibenz(a,h)anthracene	7.30E+00	--	1.21E-09	3.38E-09	8.83E-09	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	4.19E-09	1.17E-08	3.06E-09	
Iron	--	7.00E-01	4.25E-05	1.19E-04		1.70E-04
Tetrachloroethene	5.20E-02	1.00E-02	4.00E-10	1.12E-09	2.08E-11	1.12E-07
PATHWAY TOTAL =					3.78E-08	1.01E-03
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	2.60E-05	2.40E+00	1.84E-04	5.14E-07	4.77E-09	2.14E-07
Aluminum	--	5.00E-03	2.61E-03	7.31E-06		1.46E-03
Aroclor-1254	5.70E-04	--	9.05E-10	2.53E-12	5.16E-13	
Benzo(a)anthracene	8.80E-05	--	1.75E-08	4.90E-11	1.54E-12	
Benzo(a)pyrene	8.80E-04	--	2.79E-08	7.81E-11	2.45E-11	
Benzo(b)fluoranthene	8.80E-05	--	3.57E-08	1.00E-10	3.14E-12	
Dibenz(a,h)anthracene	8.80E-04	--	1.15E-08	3.23E-11	1.01E-11	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	3.69E-08	1.03E-10	3.25E-12	
Iron	--	--	4.76E-03	1.33E-05		
Tetrachloroethene	5.80E-07	2.70E-01	2.05E-03	5.74E-06	1.19E-09	2.13E-05
PATHWAY TOTAL =					6.00E-09	1.48E-03
TOTAL					2.54E-07	7.34E-02

TABLE D-14
RISK/HAZARD CALCULATIONS FOR SOIL NORTH OF MARLIN
RME -- INDUSTRIAL WORKER

Cancer Risk =	Intake*CSF or EAC * IUR	HQ =	Intake / RfD or EAC / RfC			
Parameter	Definition	Default				
Intake	Intake of chemical (mg/kg-day)	see intake				
EAC	Effective Air Concentration (mg/m^3)	see intake				
CSF	Cancer slope factor (mg/kg-day)-1	see chemprop				
IUR	Inhalation unit risk (ug/m^3)-1	see chemprop				
RfD	Reference dose (mg/kg-day)	see chemprop				
RfC	Inhalation reference concentration (mg/m^3)	see chemprop				
INGESTION						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	1.80E-08	5.04E-08	1.64E-09	2.52E-06
Aluminum	--	1.00E-01	2.29E-03	6.41E-03		6.41E-02
Aroclor-1254	2.00E+00	2.00E-05	2.94E-09	8.22E-09	5.87E-09	4.11E-04
Benzo(a)anthracene	7.30E-01	--	8.11E-08	2.27E-07	5.92E-08	
Benzo(a)pyrene	7.30E+00	--	9.68E-08	2.71E-07	7.07E-07	
Benzo(b)fluoranthene	7.30E-01	--	1.13E-07	3.18E-07	8.28E-08	
Dibenz(a,h)anthracene	7.30E+00	--	3.09E-08	8.66E-08	2.26E-07	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.01E-07	2.82E-07	7.36E-08	
Iron	--	7.00E-01	3.80E-03	1.06E-02		1.52E-02
Tetrachloroethene	5.20E-02	1.00E-02	2.25E-08	6.31E-08	1.17E-09	6.31E-06
PATHWAY TOTAL =					1.16E-06	7.97E-02
DERMAL CONTACT						
Chemical	Slope Factor	RfD	Intake Carc	Intake Noncarc	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	9.10E-02	2.00E-02	3.09E-08	8.65E-08	2.81E-09	4.32E-06
Aluminum	--	1.00E-01	3.02E-04	8.45E-04		8.45E-03
Aroclor-1254	2.00E+00	2.00E-05	5.04E-09	1.41E-08	1.01E-08	7.05E-04
Benzo(a)anthracene	7.30E-01	--	1.39E-07	3.90E-07	1.02E-07	
Benzo(a)pyrene	7.30E+00	--	1.66E-07	4.65E-07	1.21E-06	
Benzo(b)fluoranthene	7.30E-01	--	1.95E-07	5.45E-07	1.42E-07	
Dibenz(a,h)anthracene	7.30E+00	--	5.31E-08	1.49E-07	3.87E-07	
Indeno(1,2,3-cd)pyrene	7.30E-01	--	1.73E-07	4.84E-07	1.26E-07	
Iron	--	7.00E-01	5.02E-04	1.41E-03		2.01E-03
Tetrachloroethene	5.20E-02	1.00E-02	3.87E-08	1.08E-07	2.01E-09	1.08E-05
PATHWAY TOTAL =					1.98E-06	1.12E-02
INHALATION						
Chemical	IUR	RfC	EAC Carc (ug/m3)	EAC Noncarc (mg/m3)	Cancer Risk	Hazard Quotient
1,2-Dichloroethane	2.60E-05	2.40E+00	1.78E-03	4.99E-06	4.64E-08	2.08E-06
Aluminum	--	5.00E-03	2.98E-03	8.35E-06		1.67E-03
Aroclor-1254	5.70E-04	--	1.88E-09	5.27E-12	1.07E-12	
Benzo(a)anthracene	8.80E-05	--	1.76E-07	4.93E-10	1.55E-11	
Benzo(a)pyrene	8.80E-04	--	2.17E-07	6.08E-10	1.91E-10	
Benzo(b)fluoranthene	8.80E-05	--	8.61E-08	2.41E-10	7.58E-12	
Dibenz(a,h)anthracene	8.80E-04	--	6.95E-08	1.95E-10	6.11E-11	
Indeno(1,2,3-cd)pyrene	8.80E-05	--	2.37E-07	6.64E-10	2.09E-11	
Iron	--	--	1.01E-02	2.82E-05		
Tetrachloroethene	5.80E-07	2.70E-01	2.08E-02	5.83E-05	1.21E-08	2.16E-04
PATHWAY TOTAL =					5.87E-08	1.89E-03
TOTAL					3.20E-06	9.28E-02

APPENDIX E

RESTRICTIVE COVENANTS

**RESTRICTIVE COVENANT FOR LIMITATION ON USES, CONSTRUCTION AND
GROUNDWATER USE**

STATE OF TEXAS

§

Doc# 2009036112

§

COUNTY OF BRAZORIA

§

ION

This Restrictive Covenant is filed to provide information concerning certain use limitations upon that parcel of real property (the "Property") described in Exhibits A and B, attached hereto and incorporated herein by reference, and which at the time of this filing is listed on the United States Environmental Protection Agency's ("EPA") National Priority List as a "Superfund Site."

As of the date of this Restrictive Covenant, the record owners of fee title to the Property are Jack Palmer and Ron W. Hudson (individually, "Owner," and collectively, "Owners"). Mr. Palmer's address is 1509 Alta Vista, Alvin, Texas 77511. Mr. Hudson's address is 45 West Sienna Place, The Woodlands, Texas 77382. The appropriate land use for the Property is commercial/industrial.

The Property previously contained surface impoundments, which were closed in 1982 in accordance with the state industrial solid waste regulations and a closure plan as approved by the Texas Department of Water Resources.

Owners have agreed to place the following restrictions on the Property in favor of The Dow Chemical Company ("Dow"), Chromalloy American Corporation ("Chromalloy"), the Texas Commission on Environmental Quality ("TCEQ"), the State of Texas and EPA.

NOW THEREFORE, in consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the following restrictive covenants in favor of Dow, Chromalloy, TCEQ, the State of Texas and EPA are placed on the Property, to-wit:

1. Commercial/Industrial Use.

The Property shall not be used for any purposes other than commercial/industrial uses, as that term is defined under 30 T.A.C §350.4(a)(13), and thus shall not be used for human habitation or for other purposes with a similar potential for human exposure. Portions of the soils and/or groundwater of the Property contain certain identified chemicals of concern. Future users of the Property are advised to review and take into consideration environmental data from publicly available sources (i.e. TCEQ and EPA) prior to utilizing the Property for any purpose.

2. Groundwater.

The groundwater underlying the Property shall not be used for any beneficial purpose, including: (1) drinking water or other potable uses; (2) the irrigation or watering of landscapes or (3) agricultural uses. For any activities that may result in potential exposure to the groundwater,

a plan must be in place to address and ensure the appropriate handling, treatment and disposal of any affected soils or groundwater.

3. Construction.

Construction of any building on the Property is not advisable. If any person desires in the future to construct a building on the Property, the EPA and TCEQ must be notified and must approve of such construction in writing, as additional response actions, such as protection against indoor vapor intrusion, may be necessary before the Property may be built upon. The costs for any additional response actions will be borne by the party(s) desiring to construct upon the Property.

4. These restrictions shall be a covenant running with the land.

For additional information, contact:

The Dow Chemical Company
2030 Dow Center
8th Floor Legal Dept.
Midland, MI 48674
ATTN: General Counsel

Chromalloy American Corporation
C/O Sequa Corporation
200 Park Avenue
New York, NY 10166
ATTN: General Counsel

U.S. Environmental Protection Agency, Region 6
Superfund Division (6RC-S)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733
ATTN: Assistant Regional Counsel

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
ATTN: Remediation Division

State of Texas
Office of the Texas Attorney General
Natural Resources Division
300 W. 15th Street
Austin, TX 78701

The restrictions imposed by this Restrictive Covenant may be rendered of no further force or effect only by a release executed by Dow, Chromalloy, TCEQ, the State of Texas and EPA or their successors and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

**[THE REMAINDER OF THIS PAGE WAS INTENTIONALLY LEFT BLANK.
SIGNATURE PAGES CONTINUE ON NEXT PAGE]**

Executed this 7th day of July, 2009.

OWNER: Jack Palmer

* Jack P. Palmer

STATE OF TEXAS

COUNTY OF Brazoria

§
§
§

BEFORE ME, on this the 7th day of July, 2009, personally appeared Jack Palmer, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 7th day of July, 2009.

Roxann Corora

Notary Public in and for the State of Texas

My Commission Expires: 10-23-2011



Executed this 6th day of July, 2009.

OWNER: Ron W. Hudson

Ronald W. Hudson

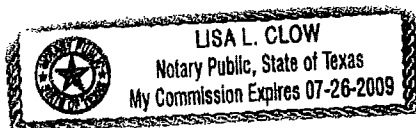
STATE OF TEXAS

COUNTY OF Montgomery

§
§
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BEFORE ME, on this the 6th day of July, 2009, personally appeared Ron W. Hudson, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 6th day of July, 2009.



Lisa L. Clow

Notary Public in and for the State of Texas

My Commission Expires: July 26, 2009

Exhibit A

Legal Description of the Property



Doyle & Wachtstetter, Inc

Surveying and Mapping • GPS/GIS

**5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 56 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 1 OF 2**

ALL THAT CERTAIN 5.0010 ACRE tract of land lying in and situated in the Frederick J. Calvit League, Abstract 51, Brazoria County, Texas, being all of Lot 56 of the Brazos Coast Investment Company Subdivision, Division 8 (B.C.I.C. Div. 8), according to the map or plat thereof recorded in Volume 2, Page 141 of the Brazoria County Plat Records (B.C.P.R.) and being the same tract of land conveyed by deed on May 12, 1999 from Fish Engineering and Construction, Inc. to Jack Palmer and Ron W. Hudson, as recorded in Clerk's File No. 99-021624 of the Brazoria County Official Records (B.C.O.R.), the herein described tract of land being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99988752832) as follows

COMMENCING at a 3/4" iron rod found marking the North corner Lot 80, same being the West corner of Lot 81 of the aforementioned B.C.I.C. Div. 8 subdivision, located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, said Point of Commencement being at Texas at State Plane Coordinate System position X=3155152.81 and Y=13556863.07, from which an old 3" x 3/4" hard-wood stake located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, found marking the North corner of Lot 66, same being the and the West corner of Lot 67 bears South 42°51'47" West, a distance of 4620.94 feet (called 4620.00 feet), at Texas State Plane Coordinate System position X=3152009.76 and Y=13553476.39, herein located point of commencement and point of reference, being shown in 1952 Dow Chemical Company survey by Herman D. Smith, RPS #916, drawing number: B8-8-19000-10488;

THENCE South 42°51'47" West, coincident with the southeastern right-of-way boundary line of said 40 foot wide platted road, a distance of 1650.34 feet to a point for the North corner of Lot 75, same being the West corner of Lot 76 of the B.C.I.C. Div. 8 subdivision, at position X=3154030.29 and Y=13555653.54;

THENCE South 47°08'13" East, coincident with the southeastern boundary line of Lot 76, same being the northeastern boundary line of Lot 75 of the B.C.I.C. Div. 8 subdivision, a distance of 660.00 feet to the **POINT OF BEGINNING**, at a 5/8" iron rod with survey cap marked "WPD 4467" set for the common corner of Lot 55, Lot 56, Lot 75 and Lot 76 of the B.C.I.C. Div. 8 subdivision and the North corner of the herein described 5.0010 acre tract, from which an iron rod with survey cap bears South 38°39' West, a distance of 11.8 feet, at position X=3154514.00 and Y=13555204.63;

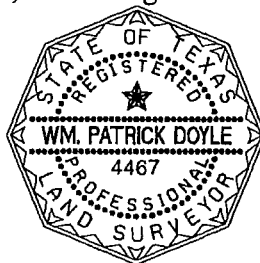
**5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 56 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 2 OF 2**

THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 55, same being the northeastern boundary line of Lot 56 of the B.C.I.C. Div. 8 subdivision, at a distance of 640.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a point in the northwestern boundary line of a 40 foot wide platted roadway, at the South corner of Lot 55, same being the East corner of Lot 56 of the B.C.I.C. Div. 8 subdivision, for the East corner of the herein described 5.0010 acre tract, at position X=3154997.71 and Y=13554755.72;

THENCE South 42°51'47" West, coincident with the northwestern right-of-way boundary line of said 40 foot wide platted road, same being the southeastern boundary line of Lot 56 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to a point for the East corner of Lot 57, same being the South corner of Lot 56 of the B.C.I.C. Div. 8 subdivision, for the South corner of the herein described 5.0010 acre tract, at position X=3154773.21 and Y=13554513.81;

THENCE North 47°08'13" West, coincident with the northeastern boundary line of Lot 57, same being the southwestern boundary line of Lot 56, at a distance of 20.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a 5/8" iron rod with survey cap marked "WPD 4467" set at the common corner of Lot 56, Lot 57, Lot 74 and Lot 75 of the B.C.I.C. Div. 8 subdivision, for the West corner of the herein described 5.0010 acre tract, at position X=3154289.50 and Y=13554962.72;

THENCE North 42°51'47" East, coincident with northwestern boundary line of Lot 56, same being the southeastern boundary line of Lot 75 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to the **POINT OF BEGINNING**, containing 5.0010 acres of land, more or less.





Wm. Patrick Doyle
Registered Professional Land Surveyor
Texas Registration Number 4467
March 24, 2009

Exhibit B

Plat Map of the Property – area covered by Restrictive Covenant for Limitation on Uses,
Construction and Groundwater Use

Doc# 2009036112
Pages 10
08/13/2009 1:44PM
Official Public Records of
BRAZORIA COUNTY
JOYCE HUDMAN
COUNTY CLERK
Fees \$52.00

Joyce Hudman

**RESTRICTIVE COVENANT FOR LIMITATION ON USES, CONSTRUCTION AND
GROUNDWATER USE**

Doc# 2009036113

STATE OF TEXAS §
 §
COUNTY OF BRAZORIA §

This Restrictive Covenant is filed to provide information concerning certain use limitations upon that parcel of real property (the "Property") described in Exhibits A and B, attached hereto and incorporated herein by reference, and which at the time of this filing is listed on the United States Environmental Protection Agency's ("EPA") National Priority List as a "Superfund Site."

ION

As of the date of this Restrictive Covenant, the record owner of fee title to the Property is **LDL COASTAL LIMITED, L.P.**, a Texas limited partnership ("Owner"), with an address of c/o Allen Daniels, 6363 Woodway Drive, Suite 730, Houston, Texas 77057. The appropriate land use for the Property is commercial/industrial.

Owner has agreed to place the following restrictions on the Property in favor of The Dow Chemical Company ("Dow"), Chromalloy American Corporation ("Chromalloy"), the Texas Commission on Environmental Quality ("TCEQ"), the State of Texas and EPA.

NOW THEREFORE, in consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the following restrictive covenants in favor of Dow, Chromalloy, TCEQ, the State of Texas and EPA are placed on the Property, to-wit:

1. Commercial/Industrial Use.

The Property shall not be used for any purposes other than commercial/industrial uses, as that term is defined under 30 T.A.C §350.4(a)(13), and thus shall not be used for human habitation or for other purposes with a similar potential for human exposure. Portions of the soils and/or groundwater of the Property contain certain identified chemicals of concern. Future users of the Property are advised to review and take into consideration environmental data from publicly available sources (i.e. TCEQ and EPA) prior to utilizing the Property for any purpose.

2. Groundwater.

The groundwater underlying the Property shall not be used for any beneficial purpose, including: (1) drinking water or other potable uses; (2) the irrigation or watering of landscapes or (3) agricultural uses. For any activities that may result in potential exposure to the groundwater, a plan must be in place to address and ensure the appropriate handling, treatment and disposal of any affected soils or groundwater.

3. Construction.

Construction of any building on the Property is not advisable. If any person desires in the future to construct a building at the Property, the EPA and TCEQ must be notified and must approve of such construction in writing, as additional response actions, such as protection against indoor vapor intrusion, may be necessary before the Property may be built upon. The costs for any additional response actions will be borne by the party(s) desiring to construct upon the Property.

4. These restrictions shall be a covenant running with the land.

For additional information, contact:

The Dow Chemical Company
2030 Dow Center
8th Floor Legal Dept.
Midland, MI 48674
ATTN: General Counsel

Chromalloy American Corporation
C/O Sequa Corporation
200 Park Avenue
New York, NY 10166
ATTN: General Counsel

U.S. Environmental Protection Agency, Region 6
Superfund Division (6RC-S)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733
ATTN: Assistant Regional Counsel

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
ATTN: Remediation Division

State of Texas
Office of the Texas Attorney General
Natural Resources Division
300 W. 15th Street
Austin, TX 78701

The restrictions imposed by this Restrictive Covenant may be rendered of no further force or effect only by a release executed by Dow, Chromalloy, TCEQ, the State of Texas and EPA or their successors and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

Executed this 28th day of July, 2009.

OWNER: **LDL COASTAL LIMITED, L.P.,**
a Texas limited partnership

By: **RAMWAY Management, L.L.C., a Texas**
limited liability company, its sole general
partner

By: *Allen B. Daniels*

Name: Allen B. Daniels

Title: Manager

STATE OF TEXAS

§

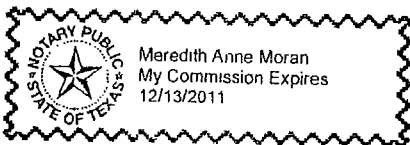
COUNTY OF Harris

§

§

BEFORE ME, on this the 28 day of July, 2009, personally appeared Allen B. Daniels, Manager, of RAMWAY Management, L.L.C., a Texas limited liability company and the sole general partner of LDL Coastal Limited, L.P., a Texas limited partnership, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 28 day of July, 2009.



Meredith Anne Moran

Notary Public in and for the State of Texas

My Commission Expires: 12/13/2011

Exhibit A

Legal Description of the Property



Doyle & Wachtstetter, Inc

Surveying and Mapping • GPS/GIS

**PARCEL No. 1, 5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 55 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 1 OF 2**

ALL THAT CERTAIN 5.0010 ACRE tract of land lying in and situated in the Frederick J. Calvit League, Abstract 51, Brazoria County, Texas, being all of Lot 55 of the Brazos Coast Investment Company Subdivision, Division 8 (B.C.I.C. Div. 8), according to the map or plat thereof recorded in Volume 2, Page 141 of the Brazoria County Plat Records (B.C.P.R.) and being the same tract of land conveyed by deed on August 6, 1999 from Janet Casciato-Northrup, Trustee of the Chapter 7 Bankruptcy Estate of Hercules Marine Services Corporation to LDL Coastal Limited, L.P., as recorded in Clerk's File No. 99-036339 of the Brazoria County Official Records (B.C.O.R.), the herein described tract of land being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99988752832) as follows

COMMENCING at a 3/4" iron rod found marking the North corner Lot 80, same being the West corner of Lot 81 of the aforementioned B.C.I.C. Div. 8 subdivision, located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, said Point of Commencement being at Texas at State Plane Coordinate System position X=3155152.81 and Y=13556863.07, from which an old 3" x 3/4" hard-wood stake located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, found marking the North corner of Lot 66, same being the and the West corner of Lot 67 bears South 42°51'47" West, a distance of 4620.94 feet (called 4620.00 feet), at Texas State Plane Coordinate System position X=3152009.76 and Y=13553476.39, herein located point of commencement and point of reference, being shown in 1952 Dow Chemical Company survey by Herman D. Smith, RPS #916, drawing number: B8-8-19000-10488;

THENCE South 42°51'47" West, coincident with the southeastern right-of-way boundary line of said 40 foot wide platted road, a distance of 1320.27 feet to a point for the North corner of Lot 76, same being the West corner of Lot 77 of the B.C.I.C. Div. 8 subdivision, at position X=3154254.79 and Y=13555895.45;

THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 77, same being the northeastern boundary line of Lot 76 of the B.C.I.C. Div. 8 subdivision, a distance of 660.00 feet to the **POINT OF BEGINNING**, at a 5/8" iron rod with survey cap marked "WPD 4467" set, from which a 5/8" iron rod bears South 37°54' West, a distance of 11.7 feet, for the common corner of Lot 54, Lot 55, Lot 76 and Lot 77 of the B.C.I.C. Div. 8 subdivision and the North corner of the herein described 5.0010 acre tract, at position X=3154738.50 and Y=13555446.53;

131 Commerce Street • Clute, Texas 77531-5601

Phone: 979-265-3622 • Fax: 979-265-9940 • Email: DW-Surveyor.com

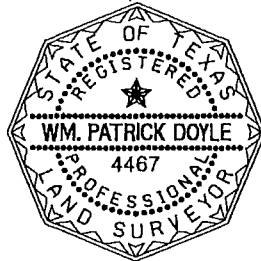
**PARCEL No. 1, 5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 55 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 2 OF 2**

THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 54, same being the northeastern boundary line of Lot 55 of the B.C.I.C. Div. 8 subdivision, at a distance of 640.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a point in the northwestern boundary line of a 40 foot wide platted roadway, at the South corner of Lot 54, same being the East corner of Lot 55 of the B.C.I.C. Div. 8 subdivision, from which an 1" iron pipe bears South 48°12' West, a distance of 1.6 feet, for the East corner of the herein described 5.0010 acre tract, at position X=3155222.22 and Y=13554997.62;

THENCE South 42°51'47" West, coincident with the northwestern right-of-way boundary line of said 40 foot wide platted road, same being the southeastern boundary line of Lot 55 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to a point for the East corner of Lot 56, same being the South corner of Lot 55 of the B.C.I.C. Div. 8 subdivision, for the South corner of the herein described 5.0010 acre tract, at position X=3154997.71 and Y=13554755.72;

THENCE North 47°08'13" West, coincident with the northeastern boundary line of Lot 56, same being the southwestern boundary line of Lot 55, at a distance of 20.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a 5/8" iron rod with survey cap marked "WPD 4467" set at the common corner of Lot 55, Lot 56, Lot 75 and Lot 76 of the B.C.I.C. Div. 8 subdivision, for the West corner of the herein described 5.0010 acre tract, from which an iron rod with survey cap bears South 38°39' West, a distance of 11.8 feet, at position X=3154514.00 and Y=13555204.63;

THENCE North 42°51'47" East, coincident with the northwestern boundary line of Lot 55, same being the southeastern boundary line of Lot 76, a distance of 330.07 feet to the **POINT OF BEGINNING**, containing 5.0010 acres of land, more or less.



A handwritten signature in black ink, appearing to read "Wm. Patrick Doyle", written over a horizontal line.

Wm. Patrick Doyle
Registered Professional Land Surveyor
Texas Registration Number 4467
March 24, 2009



Doyle & Wachtstetter, Inc

Surveying and Mapping • GPS/GIS

**PARCEL No. 2, 5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 57 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 1 OF 2**

ALL THAT CERTAIN 5.0010 ACRE tract of land lying in and situated in the Frederick J. Calvit League, Abstract 51, Brazoria County, Texas, being all of Lot 57 of the Brazos Coast Investment Company Subdivision, Division 8 (B.C.I.C. Div. 8), according to the map or plat thereof recorded in Volume 2, Page 141 of the Brazoria County Plat Records (B.C.P.R.) and being the same tract of land conveyed by deed on August 6, 1999 from Janet Casciato-Northrup, Trustee of the Chapter 7 Bankruptcy Estate of Hercules Marine Services Corporation to LDL Coastal Limited, L.P., as recorded in Clerk's File No. 99-036339 of the Brazoria County Official Records (B.C.O.R.), the herein described tract of land being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99988752832) as follows

COMMENCING at a 3/4" iron rod found marking the North corner Lot 80, same being the West corner of Lot 81 of the aforementioned B.C.I.C. Div. 8 subdivision, located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, said Point of Commencement being at Texas at State Plane Coordinate System position X=3155152.81 and Y=13556863.07, from which an old 3" x 3/4" hard-wood stake located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, found marking the North corner of Lot 66, same being the and the West corner of Lot 67 bears South 42°51'47" West, a distance of 4620.94 feet (called 4620.00 feet), at Texas State Plane Coordinate System position X=3152009.76 and Y=13553476.39, herein located point of commencement and point of reference, being shown in 1952 Dow Chemical Company survey by Herman D. Smith, RPS #916, drawing number: B8-8-19000-10488;

THENCE South 42°51'47" West, coincident with the southeastern right-of-way boundary line of said 40 foot wide platted road, a distance of 1980.40 feet to a point for the North corner of Lot 74, same being the West corner of Lot 75 of the B.C.I.C. Div. 8 subdivision, at position X=3153805.79 and Y=13555411.64;

THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 75, same being the northeastern boundary line of Lot 74 of the B.C.I.C. Div. 8 subdivision, a distance of 660.00 feet to the **POINT OF BEGINNING**, at a 5/8" iron rod with survey cap marked "WPD 4467" set for the common corner of Lot 56, Lot 57, Lot 74 and Lot 75 of the B.C.I.C. Div. 8 subdivision and the North corner of the herein described 5.0010 acre tract, at position X=3154289.50 and Y=13554962.72;

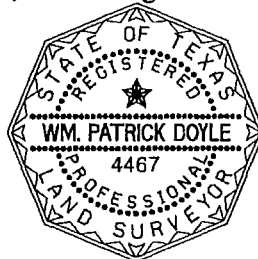
**PARCEL No. 2, 5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 57 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 2 OF 2**

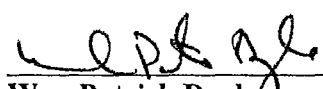
THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 56, same being the northeastern boundary line of Lot 57 of the B.C.I.C. Div. 8 subdivision, at a distance of 640.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a point in the northwestern boundary line of a 40 foot wide platted roadway, at the South corner of Lot 56, same being the East corner of Lot 57 of the B.C.I.C. Div. 8 subdivision, for the East corner of the herein described 5.0010 acre tract, at position X=3154773.21 and Y=13554513.81;

THENCE South 42°51'47" West, coincident with the northwestern right-of-way boundary line of said 40 foot wide platted road, same being the southeastern boundary line of Lot 57 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to a point for the East corner of Lot 58, same being the South corner of Lot 57 of the B.C.I.C. Div. 8 subdivision, for the South corner of the herein described 5.0010 acre tract, from which an iron rod with survey cap bears North 78°35' West, a distance of 22.4 feet, at position X=3154548.71 and Y=13554271.90;

THENCE North 47°08'13" West, coincident with the northeastern boundary line of Lot 58, same being the southwestern boundary line of Lot 57, at a distance of 20.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a 5/8" iron rod with survey cap marked "WPD 4467" set at the common corner of Lot 57, Lot 58, Lot 73 and Lot 74 of the B.C.I.C. Div. 8 subdivision, for the West corner of the herein described 5.0010 acre tract, from which an iron rod with survey cap bears South 38°39' West, a distance of 11.6 feet, at position X=3154065.00 and Y=13554720.82;

THENCE North 42°51'47" East, coincident with northwestern boundary line of Lot 57, same being the southeastern boundary line of Lot 74 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to the **POINT OF BEGINNING**, containing 5.0010 acres of land, more or less.





Wm. Patrick Doyle
Registered Professional Land Surveyor
Texas Registration Number 4467
March 18, 2009

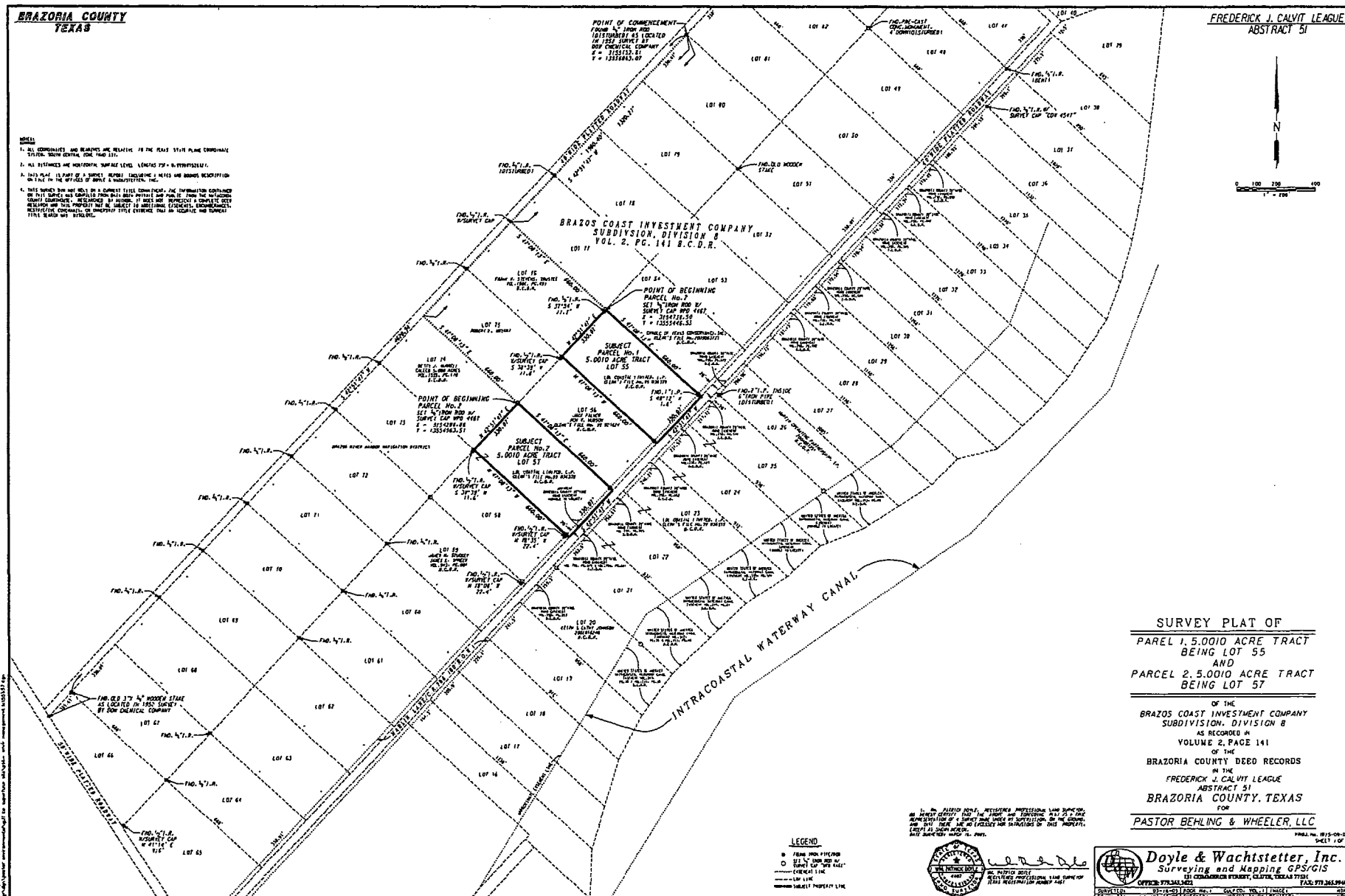
Exhibit B

Plat Map of the Property – area covered by Restrictive Covenant for Limitation on Uses,
Construction and Groundwater Use

**BRAZORIA COUNTY
TEXAS**

**FREDERICK J. CALVIT LEAGUE
ABSTRACT 51**

- NOTES:**
1. ALL DIMENSIONS AND BEARINGS ARE RELATIVE TO THE STATE PLANE COORDINATE SYSTEM, NORTH DATUM, FIVE-FIGURE.
 2. ALL DISTANCES ARE HORIZONTAL SURFACE LEVEL, UNLESS NOTED OTHERWISE.
 3. THIS PLAT IS PART OF A SURVEY BEARING THEREON, THE INFORMATION CONTAINED HEREIN IS NOT TO BE CONSIDERED AS A WARRANTY OF THE ACCURACY OF THE INFORMATION CONTAINED HEREIN, BUT IS TO BE CONSIDERED AS A WARRANTY OF THE ACCURACY OF THE INFORMATION CONTAINED HEREIN.
 4. THIS SURVEY WAS MADE BY A LICENSED SURVEYOR, THE INFORMATION CONTAINED HEREIN IS NOT TO BE CONSIDERED AS A WARRANTY OF THE ACCURACY OF THE INFORMATION CONTAINED HEREIN, BUT IS TO BE CONSIDERED AS A WARRANTY OF THE ACCURACY OF THE INFORMATION CONTAINED HEREIN.



**SURVEY PLAT OF
PARCEL 1, 5.0010 ACRE TRACT
BEING LOT 55
AND
PARCEL 2, 5.0010 ACRE TRACT
BEING LOT 57**

OF THE
BRAZOS COAST INVESTMENT COMPANY
SUBDIVISION, DIVISION B
AS RECORDED IN
VOLUME 2, PAGE 141
OF THE
BRAZORIA COUNTY DEED RECORDS
FREDERICK J. CALVIT LEAGUE
ABSTRACT 51
BRAZORIA COUNTY, TEXAS
FOR
PASTOR BEHLING & WHEELER, LLC

LEGEND

- FROM THE FIELD
- FROM THE FIELD
- SURVEY LINE
- SURVEY LINE
- SURVEY LINE



Doyle & Wachtstetter, Inc.
Surveying and Mapping GPS/GIS
OFFICE 773.343.1201
FAX 773.343.1202
COMMISSION EXPIRES 12/31/2011
12/31/2011

Doc# 2009036113
Pages 10
08/13/2009 1:44PM
Official Public Records of
BRAZORIA COUNTY
JOYCE HUDMAN
COUNTY CLERK
Fees \$52.00

Joyce Hudman

RESTRICTIVE COVENANT FOR LIMITATION ON USES AND GROUNDWATER USE

STATE OF TEXAS

§

Doc# 2009036114

§

COUNTY OF BRAZORIA

§

This Restrictive Covenant is filed to provide information concerning certain environmental conditions and use limitations upon that parcel of real property (the "Property") described in Exhibits A and B, attached hereto and incorporated herein by reference, and which at the time of this filing is listed on the United States Environmental Protection Agency's ("EPA") National Priority List as a "Superfund Site."

112

As of the date of this Restrictive Covenant, the record owner of fee title to the Property is **LDL COASTAL LIMITED, L.P.**, a Texas limited partnership ("Owner"), with an address of c/o Allen Daniels, 6363 Woodway Drive, Suite 730, Houston, Texas 77057. The appropriate land use for the Property is commercial/industrial.

LDL Coastal Limited, L.P. has agreed to place the following restrictions on the Property in favor of The Dow Chemical Company ("Dow"), Chromalloy American Corporation ("Chromalloy"), the Texas Commission on Environmental Quality ("TCEQ"), the State of Texas and EPA.

NOW THEREFORE, in consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the following restrictive covenants in favor of Dow, Chromalloy, TCEQ, the State of Texas and EPA are placed on the Property, to-wit:

1. Commercial/Industrial Use.

The Property shall not be used for any purposes other than commercial/industrial uses, as that term is defined under 30 T.A.C §350.4(a)(13), and thus shall not be used for human habitation or for other purposes with a similar potential for human exposure. Portions of the soils and/or groundwater of the Property contain certain identified chemicals of concern. Future users of the Property are advised to review and take into consideration environmental data from publicly available sources (i.e. TCEQ and EPA) prior to utilizing the Property for any purpose.

2. Groundwater.

The groundwater underlying the Property shall not be used for any beneficial purpose, including: (1) drinking water or other potable uses; (2) the irrigation or watering of landscapes or (3) agricultural uses. For any activities that may result in potential exposure to the groundwater, a plan must be in place to address and ensure the appropriate handling, treatment and disposal of any affected soils or groundwater.

3. These restrictions shall be a covenant running with the land.

For additional information, contact:

The Dow Chemical Company
2030 Dow Center
8th Floor Legal Dept.
Midland, MI 48674
ATTN: General Counsel

Chromalloy American Corporation
C/O Sequa Corporation
200 Park Avenue
New York, NY 10166
ATTN: General Counsel

U.S. Environmental Protection Agency, Region 6
Superfund Division (6RC-S)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733
ATTN: Assistant Regional Counsel

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3087
ATTN: Remediation Division

State of Texas
Office of the Texas Attorney General
Natural Resources Division
300 W. 15th Street
Austin, TX 78701

The restrictions imposed by this Restrictive Covenant may be rendered of no further force or effect only by a release executed by Dow, Chromalloy, TCEQ, the State of Texas and EPA or their successors and filed in the same Real Property Records as those in which this Restrictive Covenant is filed.

Executed this 28th day of July, 2009.

OWNER: LDL COASTAL LIMITED, L.P., a
Texas limited partnership

By: RAMWAY Management, L.L.C., a Texas
limited liability company, its sole general
partner

By: 

Name: Allen B. Daniels

Title: Manager

STATE OF TEXAS

§

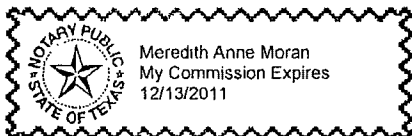
COUNTY OF Harris

§

§

BEFORE ME, on this the 28 day of July, 2009, personally appeared Allen B. Daniels, Manager, of RAMWAY Management, L.L.C., a Texas limited liability company and the sole general partner of LDL Coastal Limited, L.P., a Texas limited partnership, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that he executed the same for the purposes and in the capacity herein expressed.

GIVEN UNDER MY HAND AND SEAL OF OFFICE, this the 28 day of July, 2009.





Notary Public in and for the State of Texas

My Commission Expires: 12/13/2011

Exhibit A

Legal Description of the Property



Doyle & Wachtstetter, Inc

Surveying and Mapping • GPS/GIS

**PARCEL No. 1, 5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 58 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 1 OF 2**

ALL THAT CERTAIN 5.0010 ACRE tract of land lying in and situated in the Frederick J. Calvit League, Abstract 51, Brazoria County, Texas, being all of Lot 58 of the Brazos Coast Investment Company Subdivision, Division 8 (B.C.I.C. Div. 8), according to the map or plat thereof recorded in Volume 2, Page 141 of the Brazoria County Plat Records (B.C.P.R.) and being the same tract of land conveyed by deed on August 6, 1999 from Janet Casciato-Northrup, Trustee of the Chapter 7 Bankruptcy Estate of Hercules Marine Services Corporation to LDL Coastal Limited, L.P., as recorded in Clerk's File No. 99-036339 of the Brazoria County Official Records (B.C.O.R.), the herein described tract of land being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99988752832) as follows

COMMENCING at a 3/4" iron rod found marking the North corner Lot 80, same being the West corner of Lot 81 of the aforementioned B.C.I.C. Div. 8 subdivision, located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, said Point of Commencement being at Texas at State Plane Coordinate System position X=3155152.81 and Y=13556863.07, from which an old 3" x 3/4" hard-wood stake located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, found marking the North corner of Lot 66, same being the and the West corner of Lot 67 bears South 42°51'47" West, a distance of 4620.94 feet (called 4620.00 feet), at Texas State Plane Coordinate System position X=3152009.76 and Y=13553476.39, herein located point of commencement and point of reference, being shown in 1952 Dow Chemical Company survey by Herman D. Smith, RPS #916, drawing number: B8-8-19000-10488;

THENCE South 42°51'47" West, coincident with the southeastern right-of-way boundary line of said 40 foot wide platted roadway, a distance of 2310.47 feet to a point for the North corner of Lot 73, same being the West corner of Lot 74 of the said B.C.I.C. Div. 8 subdivision, at position X=3153581.28 and Y=13555169.73;

THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 74, same being the northeastern boundary line of Lot 73 of the said B.C.I.C. Div. 8 subdivision, a distance of 660.00 feet to the **POINT OF BEGINNING**, at a 5/8" iron rod with survey cap marked "WPD 4467" set, from which an iron rod with survey cap bears South 38°39' West, a distance of 11.6 feet, for the common corner of Lot 57, Lot 58, Lot 73 and Lot 74 of the B.C.I.C. Div. 8 subdivision and the North corner of the herein described 5.0010 acre tract, at position X=3154065.00 and Y=13554720.82;

131 Commerce Street • Clute, Texas 77531-5601

Phone: 979-265-3622 • Fax: 979-265-9940 • Email: DW-Surveyor.com

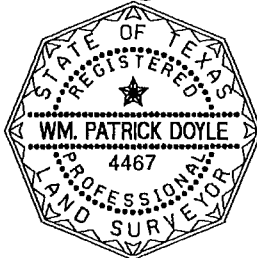
**PARCEL No. 1, 5.0010 ACRE ENVIRONMENTAL MANAGEMENT TRACT
LOT 58 OF THE BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 2 OF 2**


THENCE South 47°08'13" East, coincident with the southwestern boundary line of Lot 57, same being the northeastern boundary line of Lot 58 of the B.C.I.C. Div. 8 subdivision, at a distance of 640.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a point in the northwestern boundary line of a 40 foot wide platted roadway, at the South corner of Lot 57, same being the East corner of Lot 58 of the B.C.I.C. Div. 8 subdivision, from which an iron rod with survey cap bears North 78°35' West, a distance of 22.4 feet, for the East corner of the herein described 5.0010 acre tract, at position X=3154548.71 and Y=13554271.90;

THENCE South 42°51'47" West, coincident with the northwestern right-of-way boundary line of said 40 foot wide platted road, same being the southeastern boundary line of Lot 58 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to a point for the East corner of Lot 59, same being the South corner of Lot 58 of the B.C.I.C. Div. 8 subdivision, from which an iron rod with cap bears North 78°08' West, a distance of 22.4 feet, for the South corner of the herein described 5.0010 acre tract, at position X=3154324.20 and Y=13554030.00;

THENCE North 47°08'13" West, coincident with the northeastern boundary line of Lot 59, same being the southwestern boundary line of Lot 58, at a distance of 20.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the apparent northwest right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756, continuing a total distance of 660.00 feet to a 5/8" iron rod with survey cap marked "WPD 4467" set at the common corner of Lot 58, Lot 59, Lot 72 and Lot 73 of the B.C.I.C. Div. 8 subdivision, for the West corner of the herein described 5.0010 acre tract, at position X=3153840.49 and Y=13554478.91;

THENCE North 42°51'47" East, coincident with the northwest boundary line of Lot 58, same being the southeastern boundary line of Lot 73 of the B.C.I.C. Div. 8 subdivision, a distance of 330.07 feet to the **POINT OF BEGINNING**, containing 5.0010 acres of land, more or less.




Wm. Patrick Doyle
Registered Professional Land Surveyor
Texas Registration Number 4467
March 23, 2009



Doyle & Wachtstetter, Inc

Surveying and Mapping • GPS/GIS

**PARCEL No. 2, 24.7552 ACRE ENVIRONMENTAL MANAGEMENT TRACT
ALL OF LOT 21 THROUGH LOT 25 OF THE
BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 1 OF 3**

ALL THAT CERTAIN 24.7552 ACRE tract of land lying in and situated in the Frederick J. Calvit League, Abstract 51, Brazoria County, Texas, being all of Lots 21, 22, 23, 24 and 25 of the Brazos Coast Investment Company Subdivision, Division 8 (B.C.I.C. Div. 8), according to the map or plat thereof recorded in Volume 2, Page 141 of the Brazoria County Plat Records (B.C.P.R.) and being the same tract of land conveyed by deed on August 6, 1999 from Janet Casciato-Northrup, Trustee of the Chapter 7 Bankruptcy Estate of Hercules Marine Services Corporation to LDL Coastal Limited, L.P., as recorded in Clerk's File No. 99-036339 of the Brazoria County Official Records (B.C.O.R.), the herein described tract of land being more particularly described by metes and bounds, using survey terminology which refers to the Texas State Plane Coordinate System, South Central Zone (NAD83), in which the directions are Lambert grid bearings and the distances are surface level horizontal lengths (S.F.= 0.99988752832) as follows:

COMMENCING at a 3/4" iron rod found marking the North corner Lot 80, same being the West corner of Lot 81 of the aforementioned B.C.I.C. Div. 8 subdivision, located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, said Point of Commencement being at Texas at State Plane Coordinate System position X=3155152.81 and Y=13556863.07, from which an old 3" x 3/4" hard-wood stake located in the southeastern right-of-way boundary line of a 40 foot wide platted roadway of the said B.C.I.C. Div. 8 subdivision, found marking the North corner of Lot 66, same being the and the West corner of Lot 67 bears South 42°51'47" West, a distance of 4620.94 feet (called 4620.00 feet), at Texas State Plane Coordinate System position X=3152009.76 and Y=13553476.39, herein located point of commencement and point of reference, being shown in 1952 Dow Chemical Company survey by Herman D. Smith, RPS #916, drawing number: B8-8-19000-10488;

THENCE South 47°08'13" East, a distance of 1360.00 feet to a point for corner, located in the northwestern boundary line of Lot 32 of the B.C.I.C. Div. 8 subdivision, same being the southeastern right-of-way boundary line of a 40 foot wide platted roadway, at position X=3156149.54 and Y=13555938.04;

THENCE South 42°51'47" West, coincident with the northwestern boundary line of Lot 26 through Lot 32 of the B.C.I.C. Div. 8 subdivision, same being the southeastern right-of-way boundary line of said 40 foot wide platted road, a distance of 1250.83 feet to the **POINT OF BEGINNING** of the description, from which a 2" iron pipe inside a 6" iron pipe found disturbed bears South 44°30' East, a distance of 20.7 feet, said point being the West corner of Lot 26, same being the North corner of Lot 25 of the B.C.I.C. Div. 8 subdivision and the herein described 24.7552 acre tract, at position X=3155298.76 and Y=13555021.31;

**PARCEL No. 2, 24.7552 ACRE ENVIRONMENTAL MANAGEMENT TRACT
ALL OF LOT 21 THROUGH LOT 25 OF THE
BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 2 OF 3**

THENCE South 47°08'13" East, coincident with the northeastern boundary line of Lot 25, same being the southwestern boundary line of Lot 26 of the B.C.I.C. Div. 8 subdivision, at a distance of 20.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the southeastern right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756 and being the East corner of all that certain 20 foot wide road easement conveyed by deed on August 15, 1961 from Joe M. Baggett, et al to Brazoria County, as recorded in Volume 798, Page 674 of the Brazoria County Deed Records (B.C.D.R.), at a distance of 730.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set for reference corner, continuing for a total distance of 1030.00 feet to a point, at the South corner of said Lot 26, East corner of said Lot 25 and the East corner of the United States of America Intracoastal Waterway easement, for the East corner of the herein described 24.7552 acre tract, at position X=3156053.65 and Y=13554320.73;

THENCE South 67°31'58" West, with the southeastern boundary line of said Lot 25 and said United States of America Intracoastal Waterway easement, a distance of 239.59 feet to the South corner of said Lot 25, same being the East corner of said Lot 24, for an angle corner of the herein described 24.7552 acre tract, at position X=3155832.27 and Y=13554229.18;

THENCE South 47°18'32" West, with the southeastern boundary line of said Lot 24 and said United States of America Intracoastal Waterway easement, a distance of 232.21 feet to the South corner of said Lot 24, same being the East corner of said Lot 23, for an angle corner of the herein described 24.7552 acre tract, at position X=3155661.61 and Y=13554071.75;

THENCE South 56°59'51" West, with the southeastern boundary line of said Lot 23 and said United States of America Intracoastal Waterway easement, a distance of 253.89 feet to the South corner of said Lot 23, same being the East corner of said Lot 22, for an angle corner of the herein described 24.7552 acre tract, at position X=3155448.71 and Y=13553933.48;

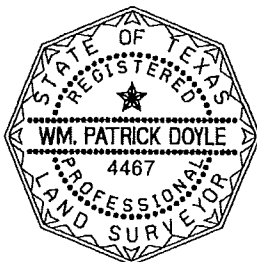
THENCE South 45°45'48" West, with the southeastern boundary line of said Lot 22 and the said United States of America Intracoastal Waterway easement, a distance of 256.93 feet to the south corner of said Lot 22, same being the East corner of said Lot 21, for an angle corner of the herein described 24.7552 acre tract, at position X=3155264.64 and Y=13553754.25;

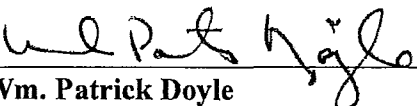
THENCE South 46°33'11" West, with the southeastern boundary line of said Lot 21 and the said United States of America Intracoastal Waterway easement, a distance of 264.15 feet to the East corner of Lot 20, same being the South corner of said Lot 21 of the B.C.I.C. Div. 8 subdivision and the South corner of the herein described 24.7552 acre tract, at position X=3155072.89 and Y=13553572.62;

**PARCEL No. 2, 24.7552 ACRE ENVIRONMENTAL MANAGEMENT TRACT
ALL OF LOT 21 THROUGH LOT 25 OF THE
BRAZOS COAST INVESTMENT COMPANY SUBDIVISION, DIVISION 8
FREDERICK. J. CALVIT LEAGUE, ABSTRACT 51
BRAZORIA COUNTY, TEXAS
PAGE 3 OF 3**

THENCE North 47°08'13" West, coincident with the southwestern boundary line of Lot 21, same being the northeastern boundary line of Lot 20, at a distance of 220.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set for reference corner, at a distance of 800.00 feet pass a 5/8" iron rod with survey cap marked "WPD 4467" set in the southeastern right-of-way boundary line of the 80 foot wide Marlin Lane, known as Brazoria County Road #756 and the South corner of the of a 20 foot wide roadway easement conveyed on August 15, 1961 from R. F. Dwyer, III to Brazoria County, as recorded in Volume 798, Page 679 of the B.C.D.R., continuing for a total distance of 820.00 feet to a point for corner in the southeast right-of-way boundary line of said 40 foot wide platted roadway, at the North corner of Lot 20, West corner of Lot 21 and the West corner of the herein described 24.7552 acre tract, at position X=3154471.91 and Y=13554130.36;

THENCE North 42°51'47" East, coincident with the northwestern boundary line of Lot 21 through Lot 25 of the B.C.I.C. Div. 8 subdivision, same being the southeastern right-of-way boundary line of said 40 foot wide platted road, a distance of 1215.65 feet to the **POINT OF BEGINNING**, containing 24.7552 acres of land, more or less.




Wm. Patrick Doyle
Registered Professional Land Surveyor
Texas Registration Number 4467
March 23, 2009

This description is based on a survey, a plat of which, March 18, 2009 is on file in the office of Doyle & Wachtstetter, Inc.
Legal\pat\Pastor Behling & Wheeler\ Gulfco Superfund Lot21 through Lot25 Environmental Management 24.7552 Acre Tract BCIC#8.doc

Exhibit B

Plat Map of the Property – area covered by Restrictive Covenant for Limitation on Uses and
Groundwater Use

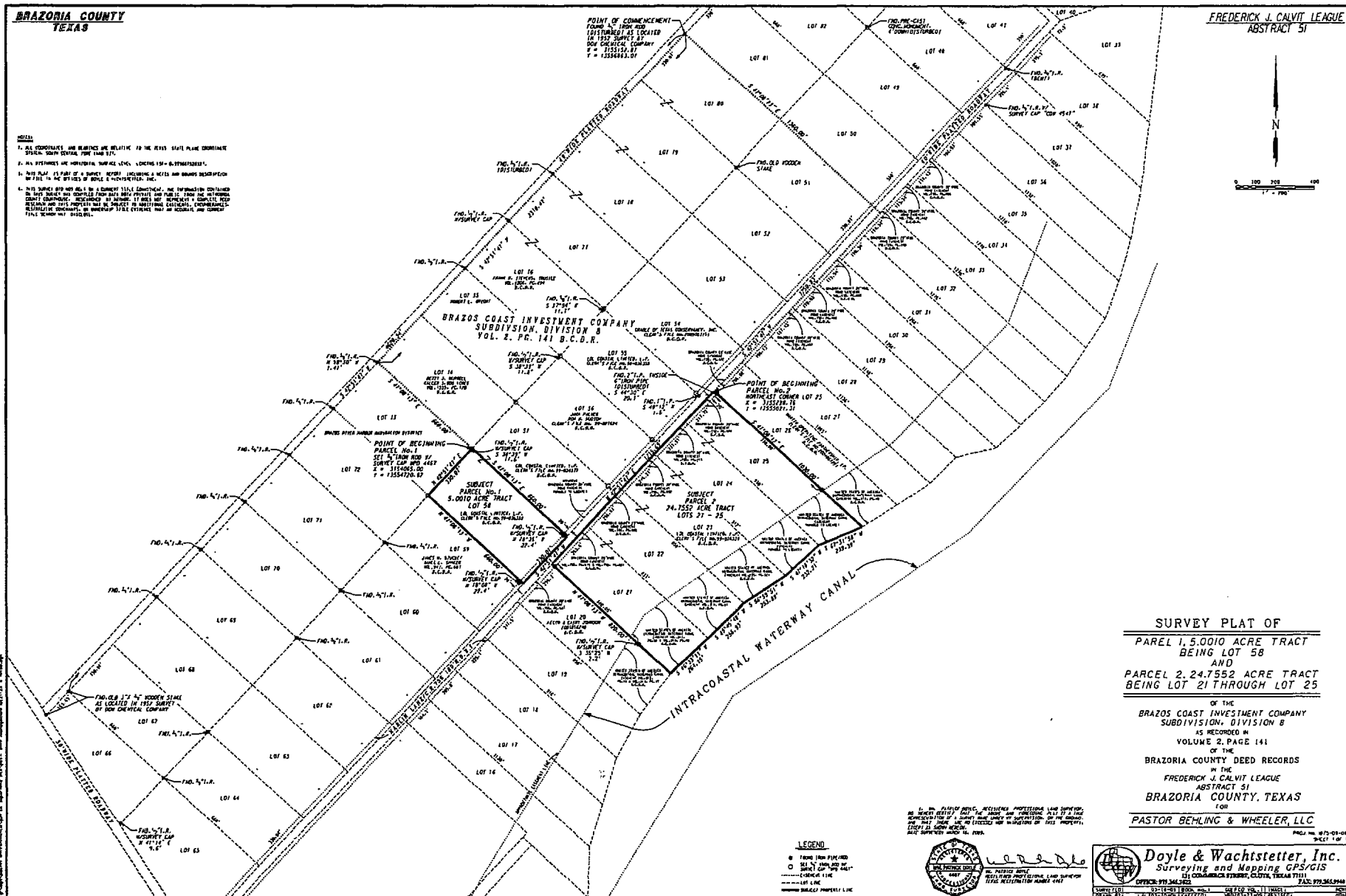
FREDERICK J. CALVIT LEAGUE
ABSTRACT 51

7. GEOLOGICAL AND REMAINS ARE RELATIVE TO THE WEST STATE PLAIN ORIGINATE
SPECIAL SURVEY CENTRAL PLOT 1040 57.

8. THE SURVEYERS ARE MODERN SURVEYING SENSORS, LOCATING 150 - 6.77666253232.

9. THIS PLAN IS PART OF A SURVEY REPORT INCLUDING A MAP AND BOUNDARY DESCRIPTION
OF THE LAND OF THE OFFICE OF THE PEOPLE & CHRISTIANITY, INC.

10. THIS SURVEY REPORT MAY BE A CURRENT TITLE, CONVEYANCE, THE INFORMATION CONTAINED
IN THIS SURVEY HAS BEEN OBTAINED FROM A SURVEYOR AND THE PUBLIC, FROM THE HISTORICAL
RECORDS, INCLUDING RECORDS, IN THE PUBLIC RECORDS, FROM THE HISTORICAL
RECORDS, AND THIS PROPERTY MAY BE SUBJECT TO ADDITIONAL EXISTING, CONVEYANCES,
RELATIVE CONVEYANCES, OR OTHERWISE BY THE PUBLIC, EVIDENCE MAY BE ACCURATE AND COMPLETE.



SURVEY PLAT OF
PARCEL 1.50010 ACRE TRACT
BEING LOT 58
AND
PARCEL 2.247552 ACRE TRACT
BEING LOT 21 THROUGH LOT 25

OF THE
BRAZOS COAST INVESTMENT COMPANY
SUBDIVISION, DIVISION 8
AS RECORDED IN
VOLUME 2, PAGE 141
OF THE
BRAZORIA COUNTY DEED RECORDS
IN THE
FREDERICK J. CALVIT LEAGUE
ABSTRACT 51
BRAZORIA COUNTY, TEXAS

PASTOR BEHLING & WHEELER, LLC

LEGEND

● Trench / Iron Pipe / Rock
○ Set 1/2" Iron Pipe in
Junction Cup 100' 400'
----- Elevation Line
--- Left Line
===== Slope of Property L.




Doyle & Wachtstetter, Inc.
 Surveying and Mapping GPS/GIS
 131 COMMERCE STREET, CLUTE, TEXAS 77111
 OFFICE: 979.346.3622 FAX: 979.346.9948
 SURVEY (E) 03-10-01 (BOOK, INC.) SEE FCO VOL. 11 INAGL. MCH

Doc# 2009036114
Pages 11
08/13/2009 1:44PM
Official Public Records of
BRAZORIA COUNTY
JOYCE HUDMAN
COUNTY CLERK
Fees \$56.00

Joyce Hudman